



EXAMINATION OF RESPIRATORY SYSTEM

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Respiratory system examination in two way

- 1. Examination from anteriorly / front**
- 2. Examination from the back**

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Examination of respiratory system

Inspection

Palpation

Percussion

Auscultation

stand right side of the patient

As-Salam-u-Alaikum

Give Salam

Introduce yourself to the patient





Now proper exposure
Remove the clothes

Proper position of the
patient –arm should be
full abducted so that you
see the lateral surface of
the thorax



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INSPECTION



1. LOOK AT THORAX



2. Just incline your head and Look at patient left lateral side of thorax



Now look at patient supra-clavicular region



Inspection

- Size And Shape Of Chest Wall

- See Any Asymmetry Present Or not

Movement Of The Chest

Respiratory Rate And Rhythm , Pattern

- Evidence of respiratory distress
 - Intercostals fullness or recession / in drawing
 - Suprasternal , Supraclavicular excavation
 - Prominence of accessory respiratory muscle
 - lip pursing

- Neck swelling –SVO
- Scar mark, visible impulse and Engorged vein present or not
- Gynaecomastia and spider nevi and pigmentation

Chest movement



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How will u see this?

Sit down right side of the patient at such a position that your eye & And chest wall remain same horizontal level .

Then goes to the foot end of the patient or head end & again sit down in such way That your eye and chest remain in same horizontal plane

Any restriction of movement present or not

If present then mention unilateral or bilateral restriction and Upper part or lower part of the chest





- Respiratory Rate And Rhythm , Pattern
- Look like this count respiratory rate for 15 second And then multiply with 4

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1. SIZE & SHAPE OF CHEST WALL

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NORMAL ADULT CHEST



The normal chest is bilaterally symmetrical and elliptical in cross-section

Then any deformity presents such deformity of sternum, spine and chest wall

Abnormal
size and shape
of chest

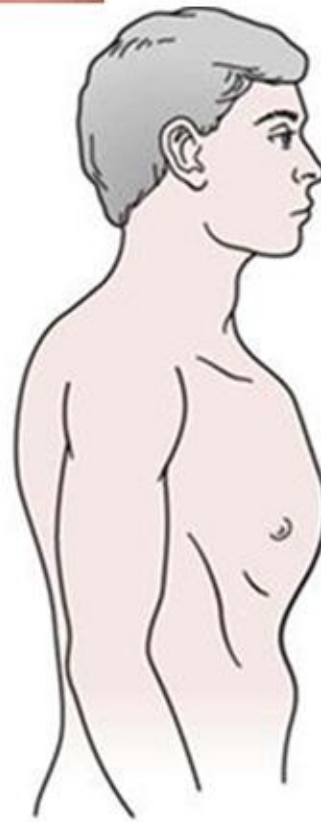
Deformity of Sternum

Pectus carinatum

(pigeon chest).

Pectus excavatum

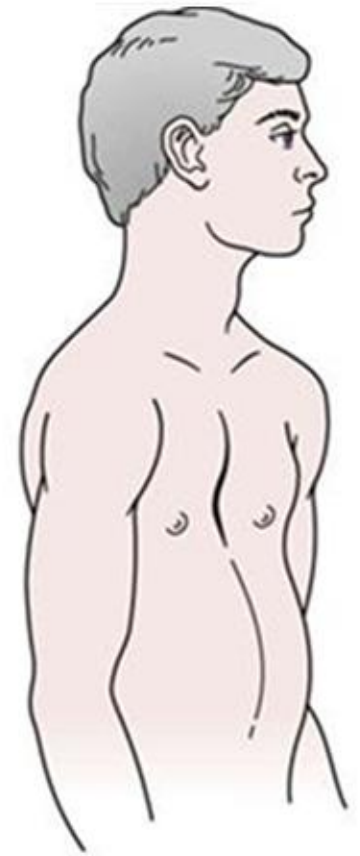
(funnel chest).



PECTUS CARINATUM



protrusion
of sternum



PECTUS EXCAVATUM



depression
of sternum



REGION CHEST



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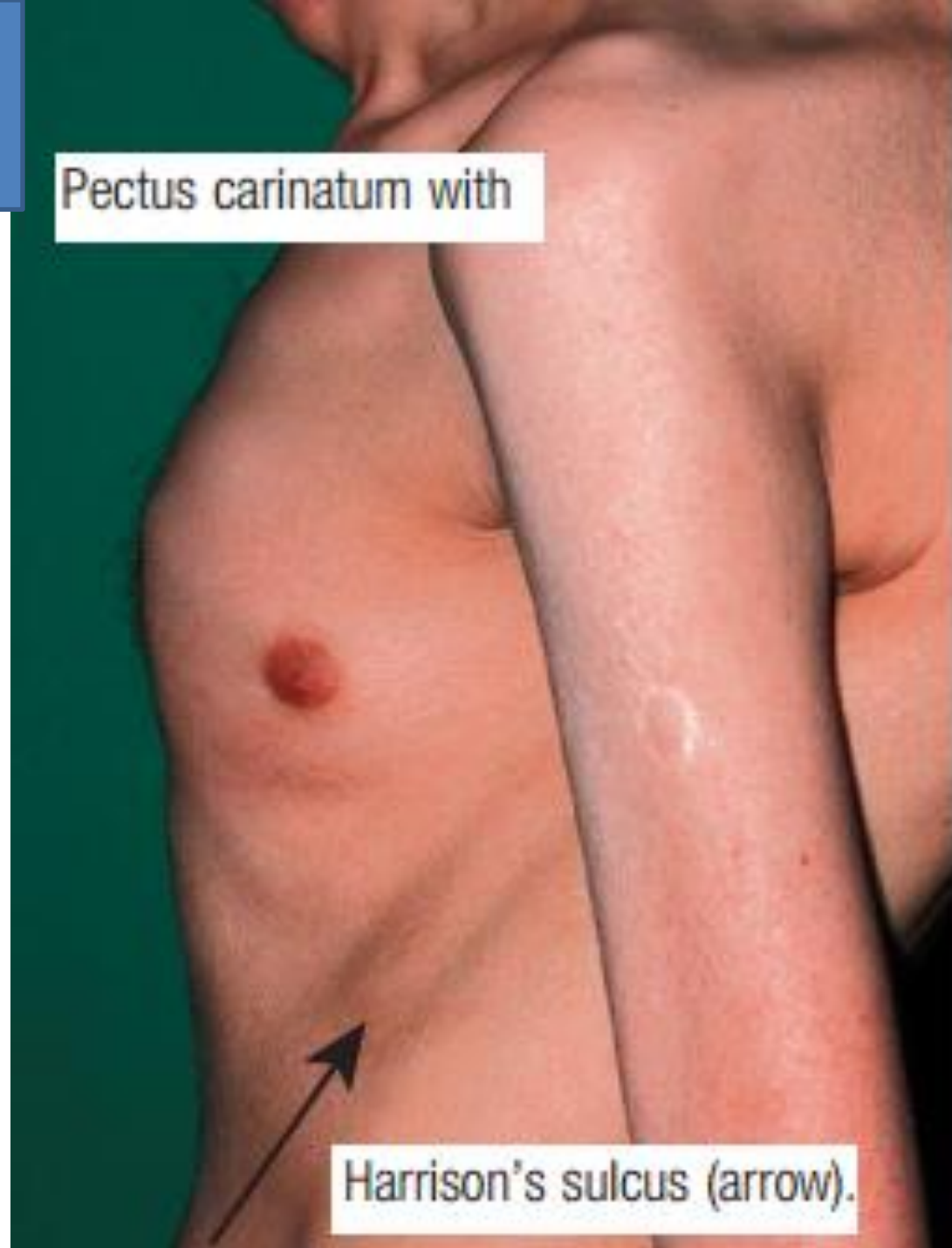
Pectus carinatum (pigeon chest)

Sternum and costal cartilages are prominent and protrude from the chest or forward bulging of the chest

Cause

1. childhood asthma
2. osteomalacia and rickets

Pectus carinatum with

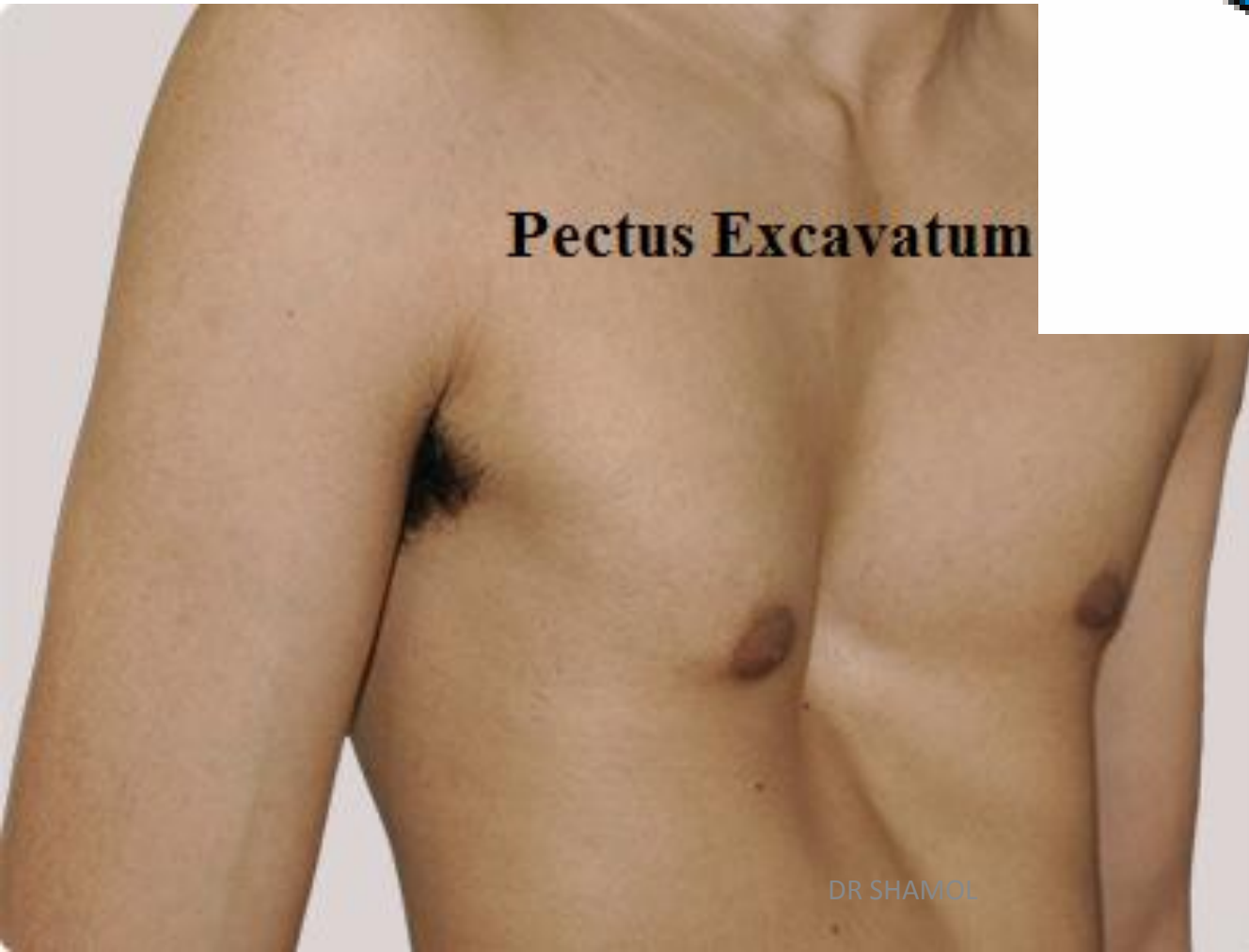


Harrison's sulcus (arrow).

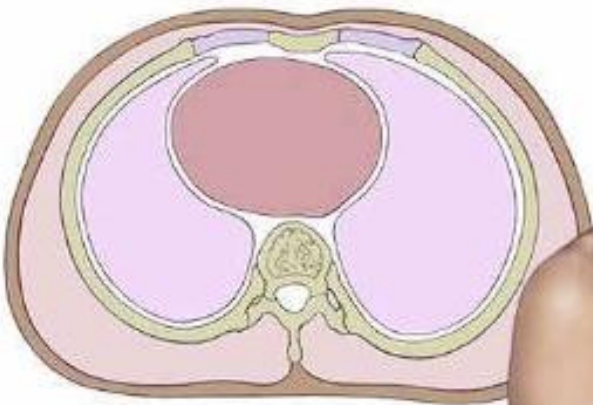
FUNNEL SHAPED CHEST



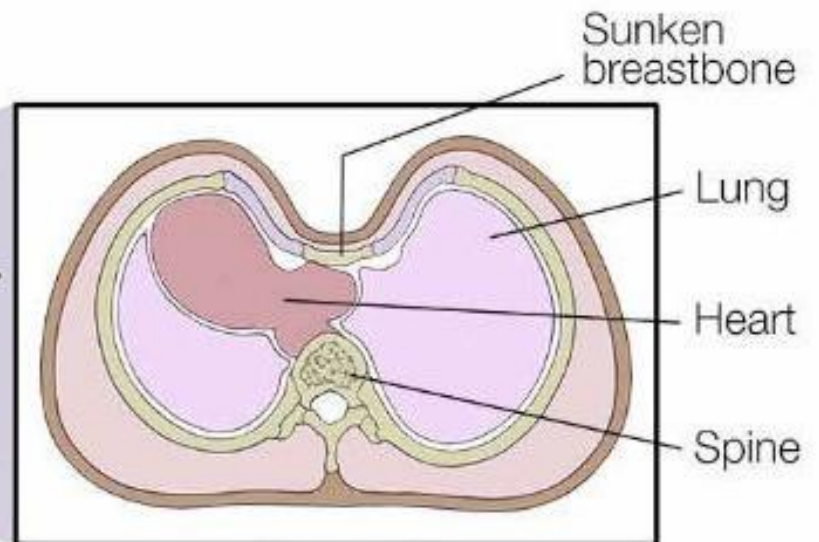
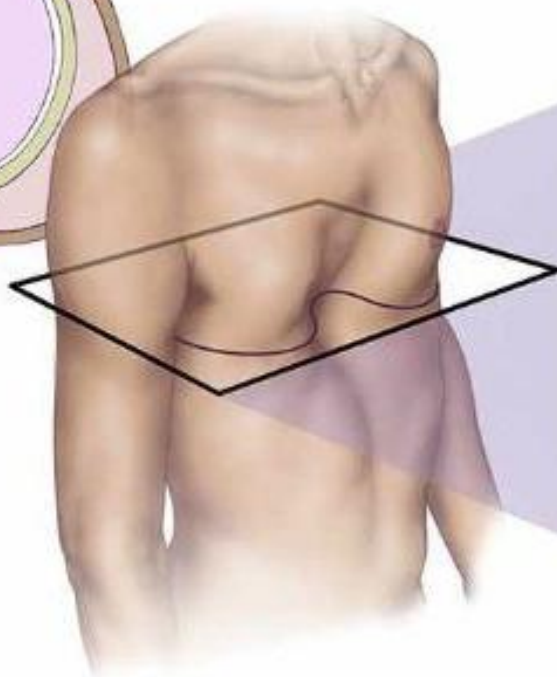
Pectus Excavatum



Normal
(cross section of chest)



Pectus excavatum



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MAYO

Pectus excavatum (funnel chest).

- Sternum and costal cartilages appear depressed into the chest

Cause

1. childhood asthma
2. osteomalacia and rickets





Deformity of chest wall

BARREL CHEST

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NORMAL CHEST



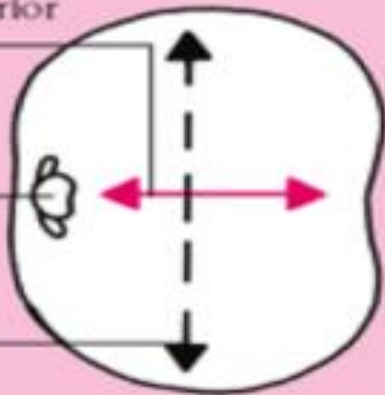
BARREL CHEST



Anteroposterior diameter

Spinal cord

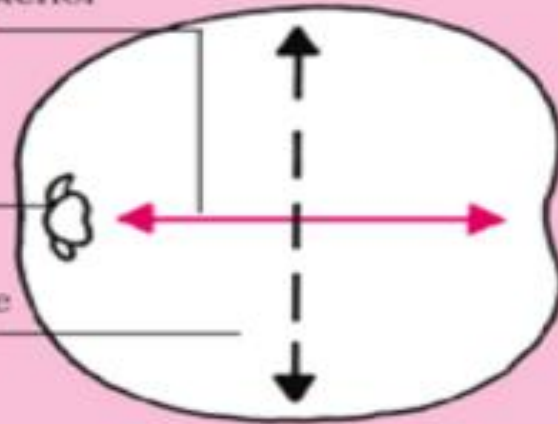
Transverse diameter



Anteroposterior diameter

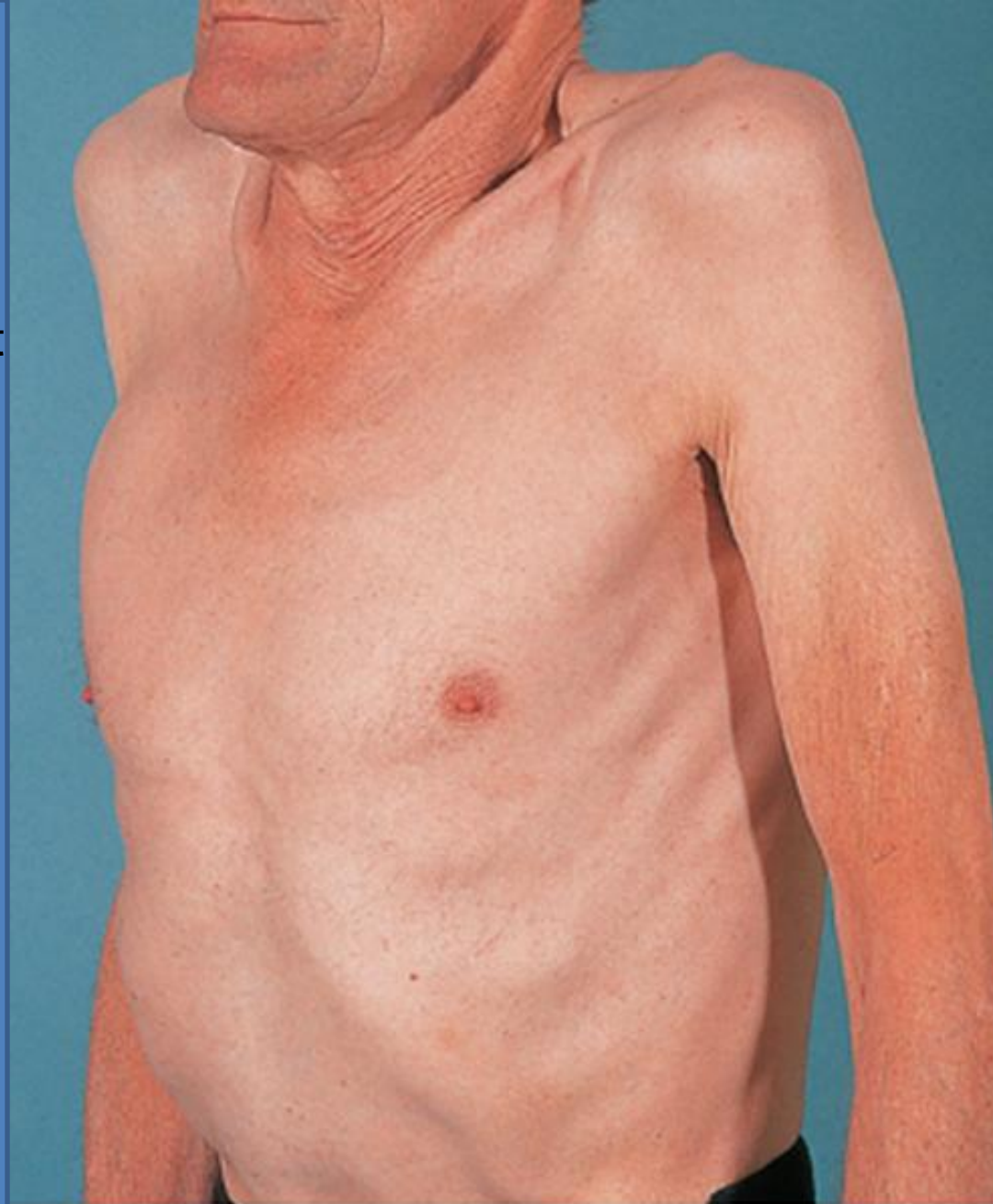
Spinal cord

Transverse diameter



Chest wall

- Barrel shape chest present or not
- In normal chest transverse diameter is more than the Ant. post diameter.
- The ratio is Trans : ant.-post = 7:5
- In barrel shape chest ant-post. Diameter is more than the transverse diameter
- Cause
It is found in emphysema



How will u measure barrel shape chest

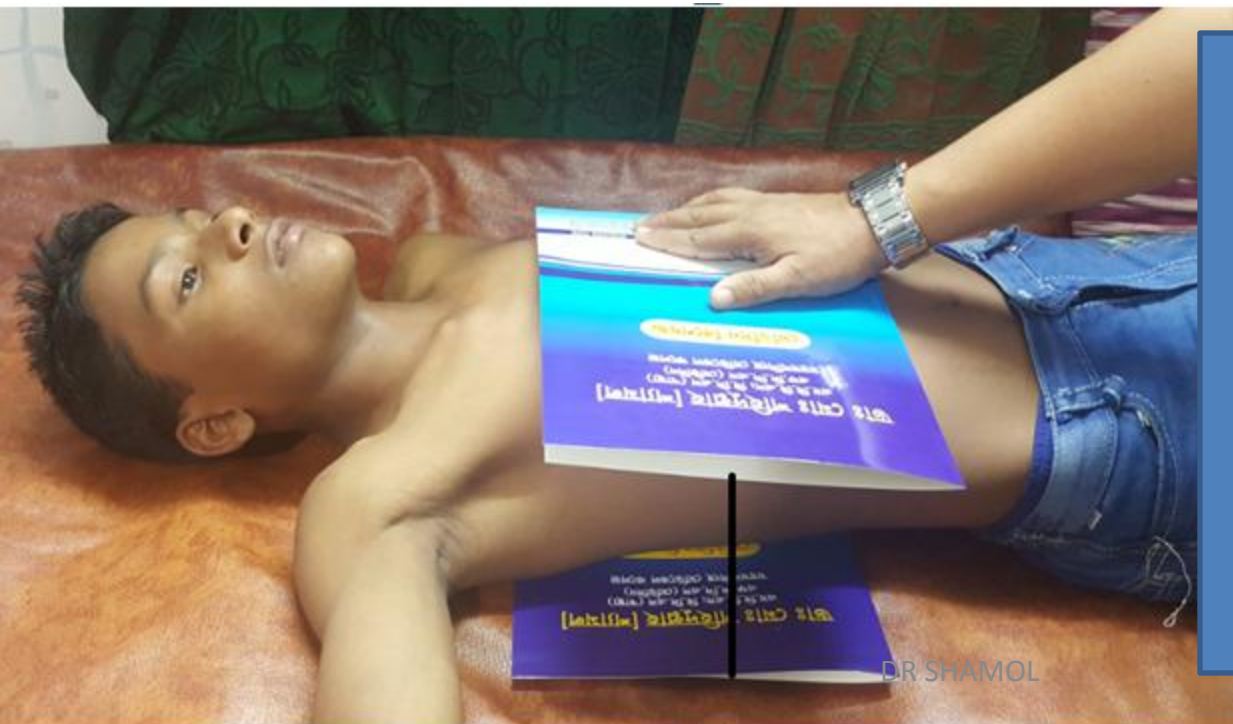
Keep two hard broad both side of chest and measure the diameter in between them at level of nipple it is transverse diameter

Now keep two hard broad above and below of the chest and measure the diameter in between them at level of nipple it is ant-post diameter





Keep two hard broad both side of chest and measure the diameter in between them at level of nipple it is transverse diameter



Now keep two hard broad above and below of the chest and measure the diameter in between them at level of nipple it is ant-post diameter

DEFORMITY OF SPINE



Scoliosis



Kyphosis

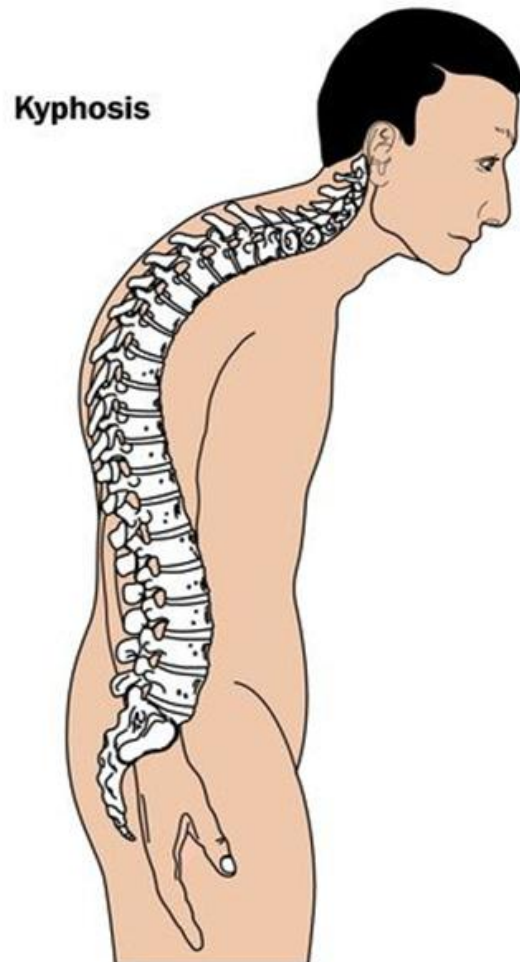


Lordosis

Kyphosis forward bending of the vertebral column

Scoliosis lateral bending of the vertebral column

Kyphoscoliosis combination of both

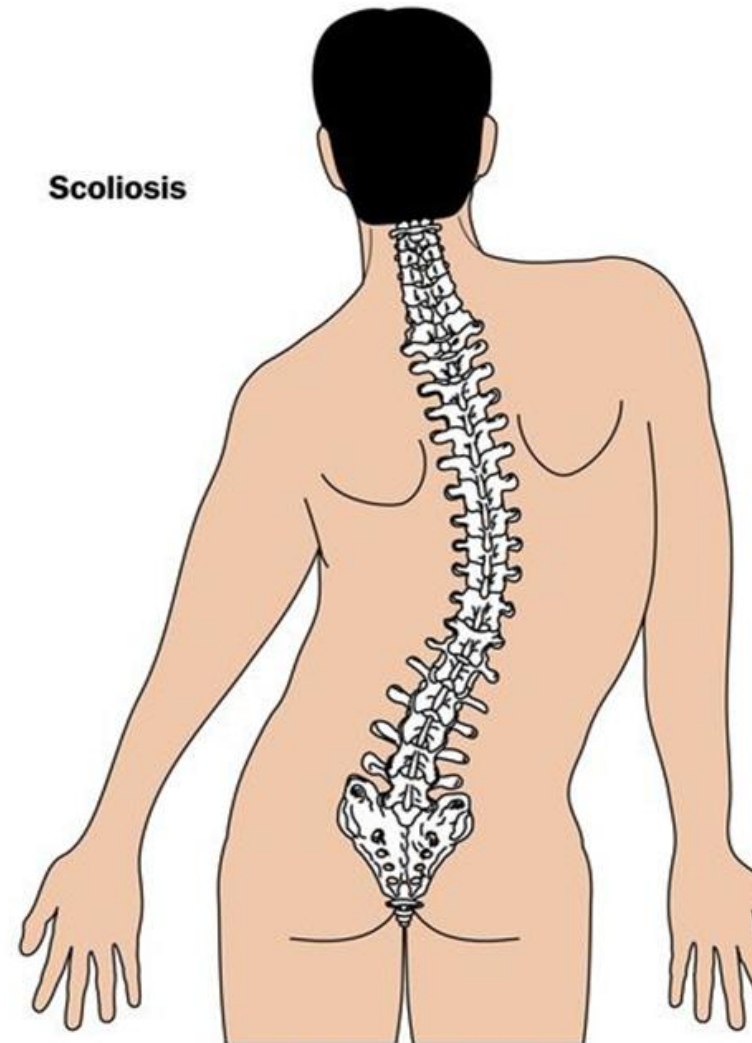


KYPHOTIC SPINE

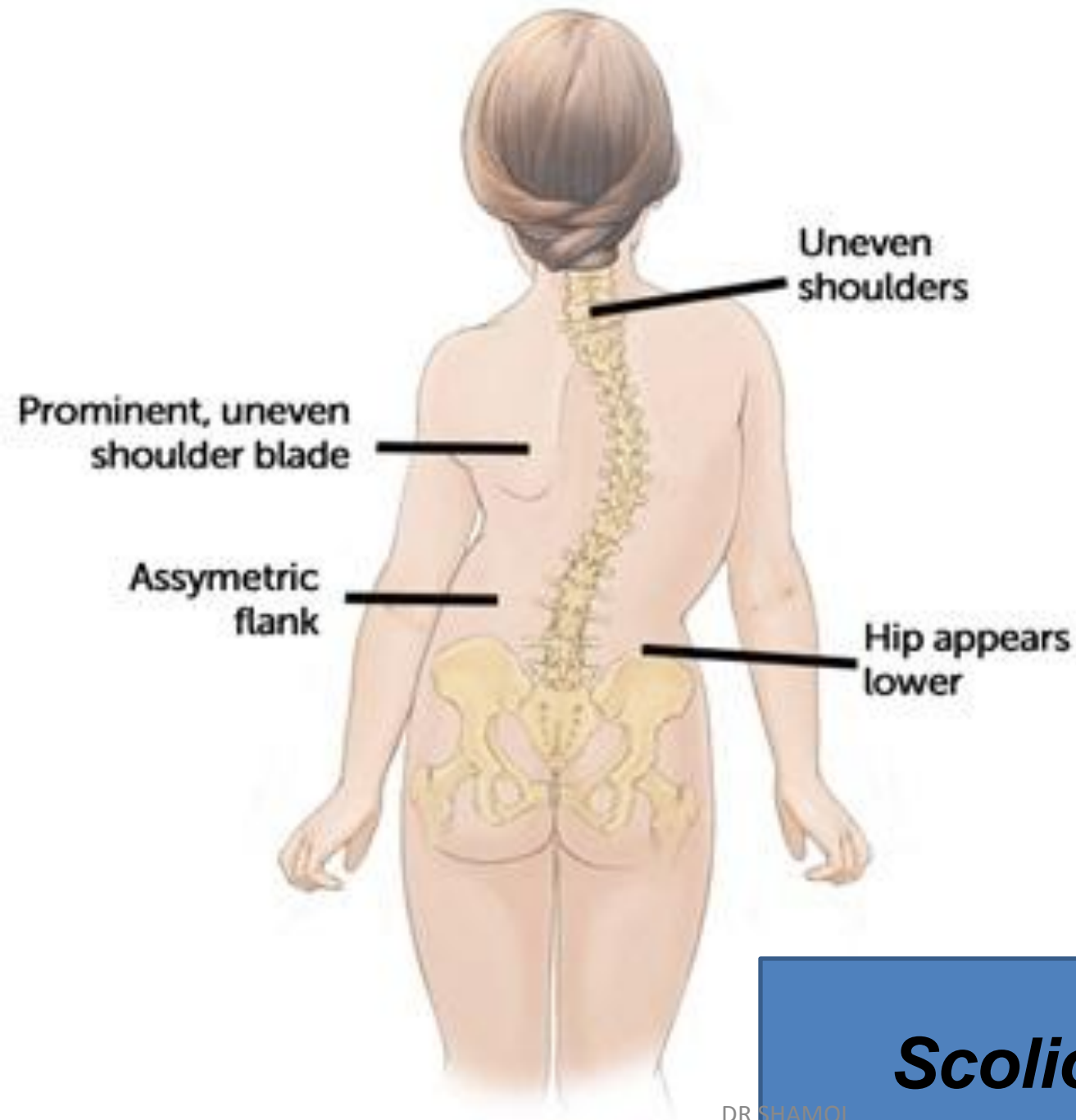


NORMAL SPINE

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SCOLIOTIC SPINE



Scoliosis

Kyphosis



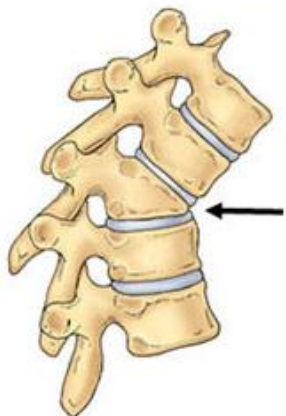
Scoliosis



Kyphosis



Scoliosis



2.SEE ANY ASYMMETRY PRESENT OR NOT

1. Wasting
 2. Flattening of chest,
 3. Dropping of shoulder
(These three occur due to fibrosis underlying lung)
 - 4.Swell of chest
- If present please mention right or left side chest and upper

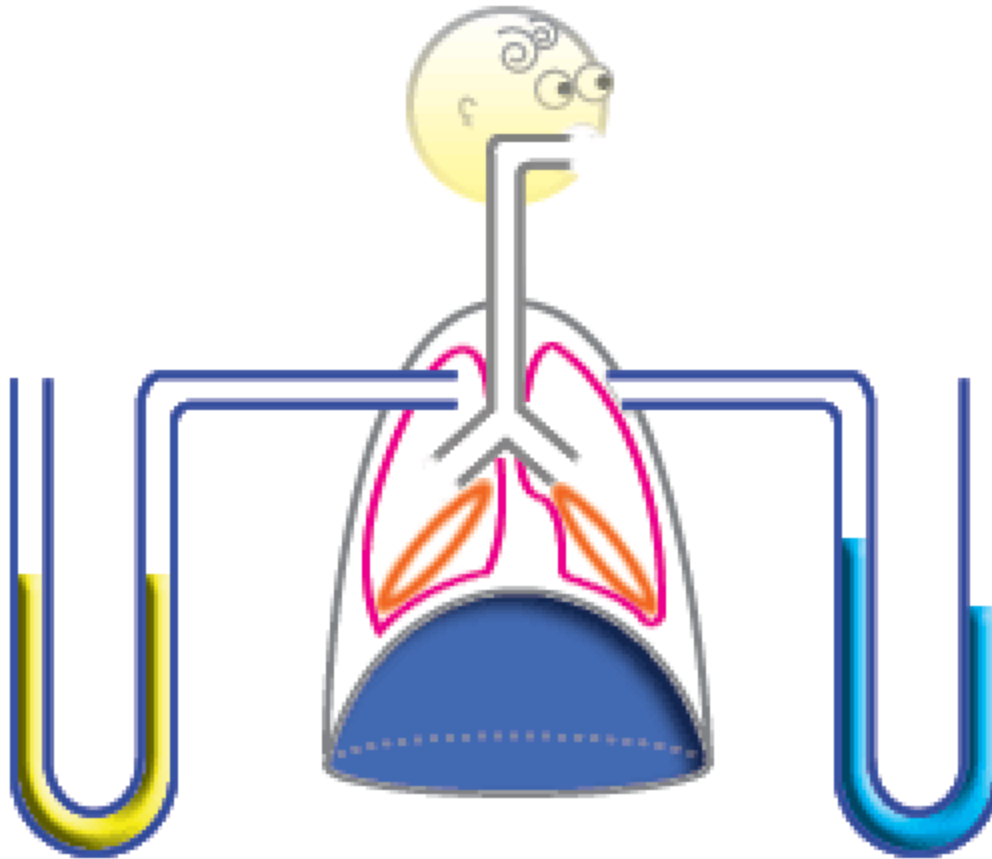


**wasting and flattening
of left chest**



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Symmetry of movement



Causes of asymmetry of movement

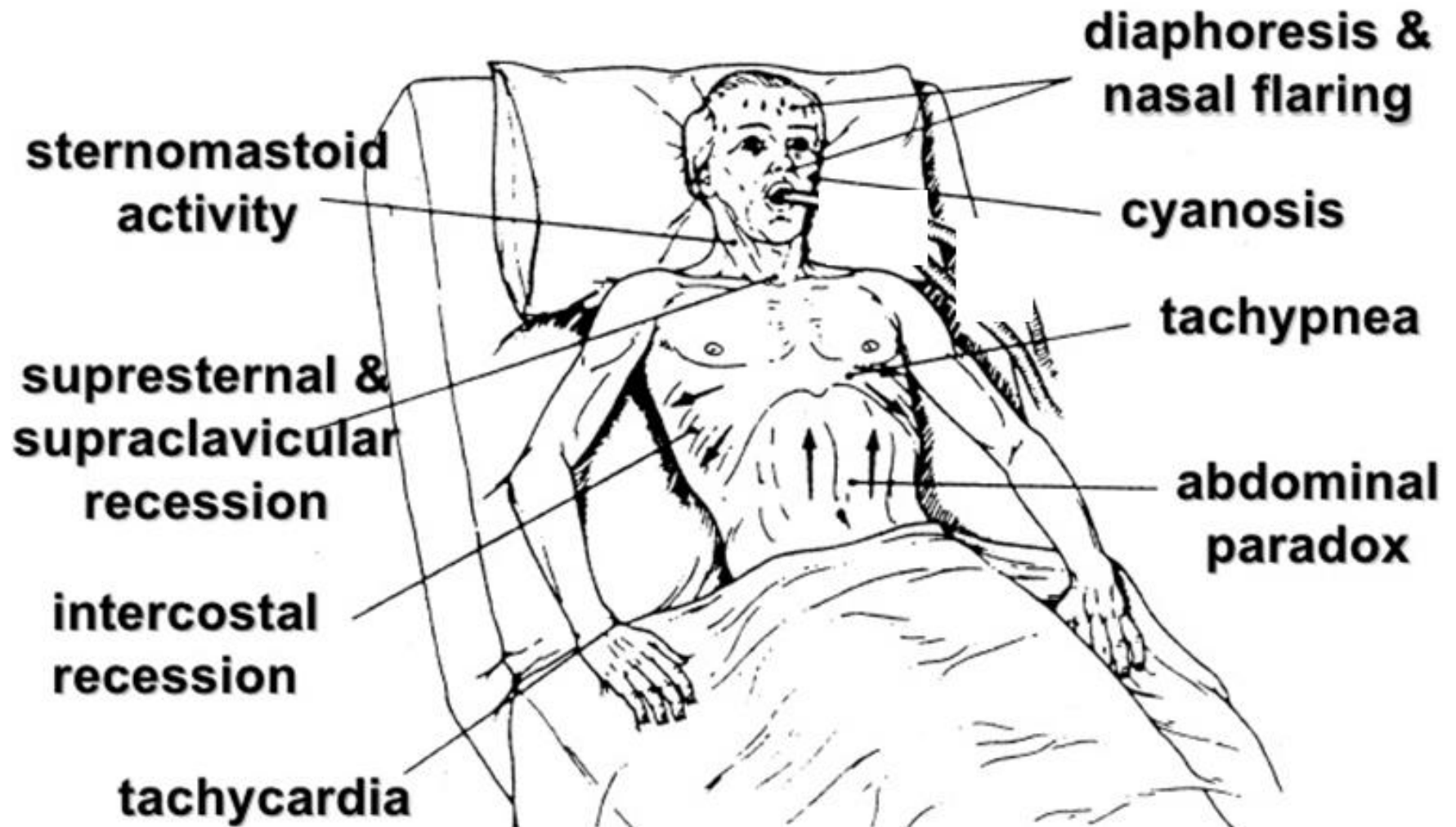
Cause of unilateral restriction

- Fibrosis
- Collapse
- Pleural effusion
- Pneumothorax
- Consolidation

Cause if bilateral restriction

- Emphysema
- Ankylosing spondylosis

- Evidence of respiratory distress
 - Intercostals fullness or recession / in drawing
 - Suprasternal , Supraclavicular excavation
 - Prominence of accessory respiratory muscle
 - lip purs



Tobin MJ. Principles and Practice of MV. 1994.

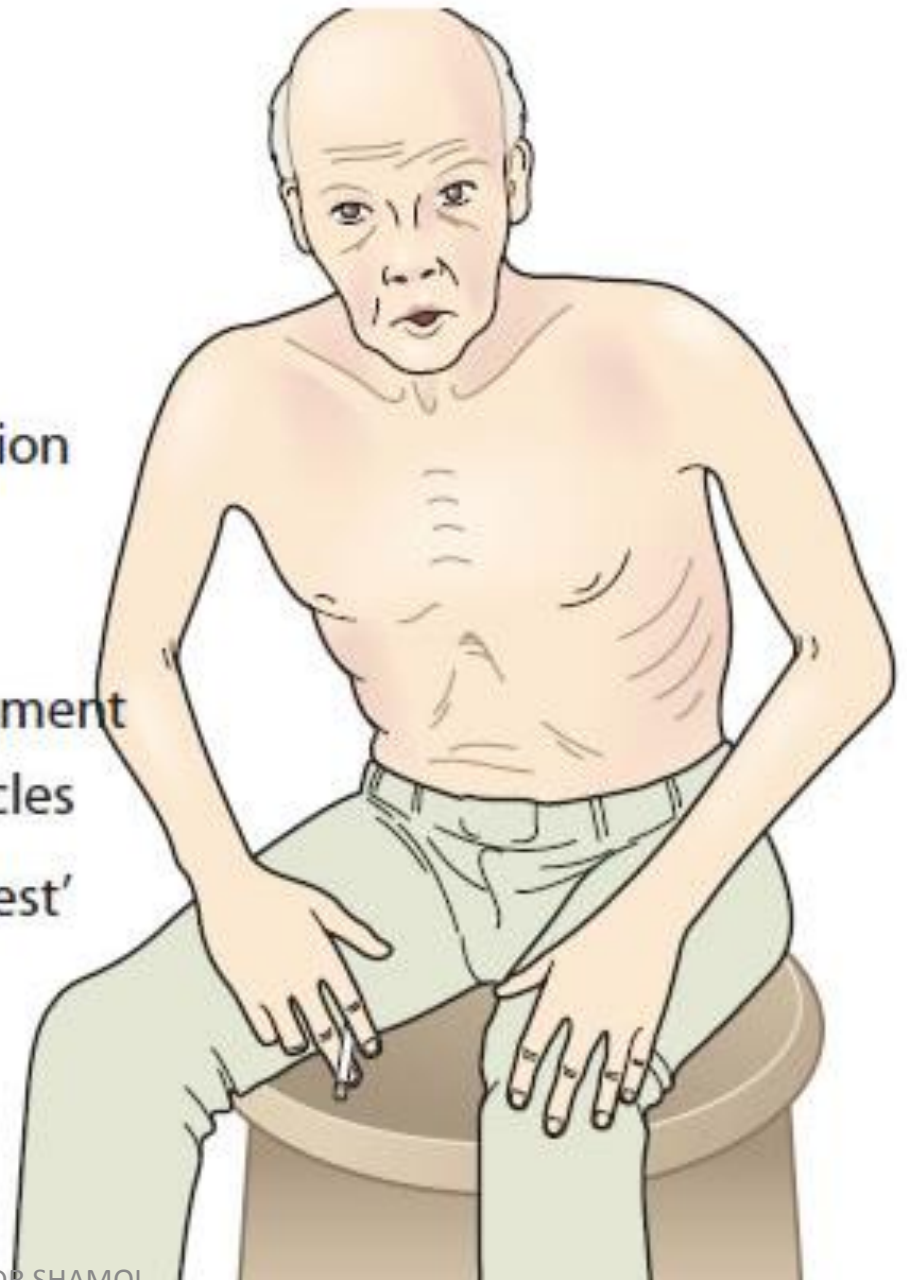
Thin with loss of muscle mass

Pursed-lip breathing

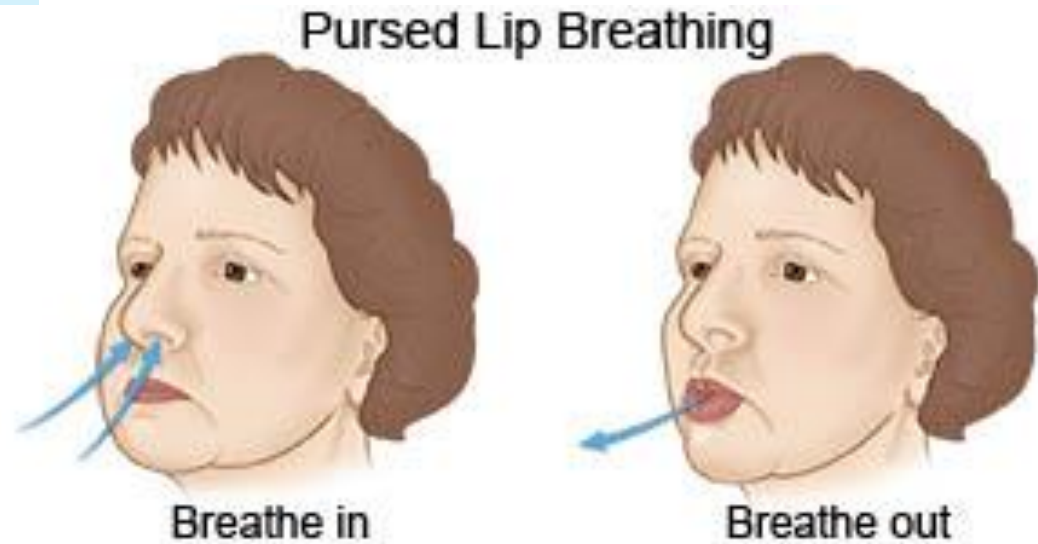
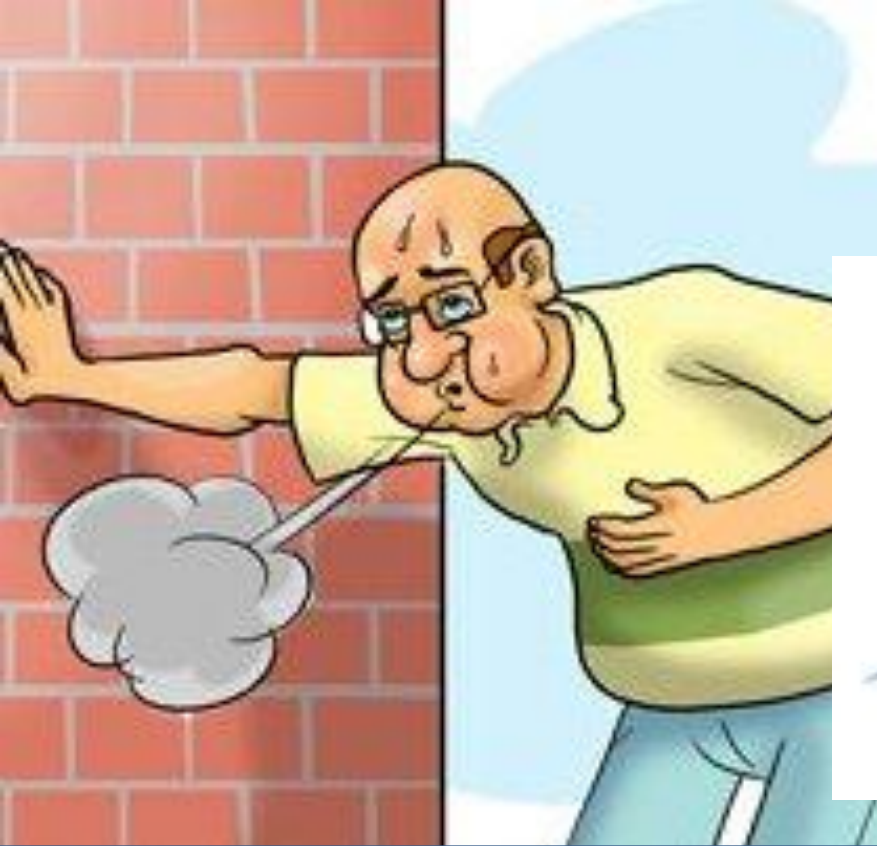
Increased work of breathing:

- leaning forward
- accessory muscles of respiration
- tracheal tug
- nasal flare
- paradoxical abdominal movement
- indrawing of intercostal muscles

Hyperinflated chest – 'barrel chest'

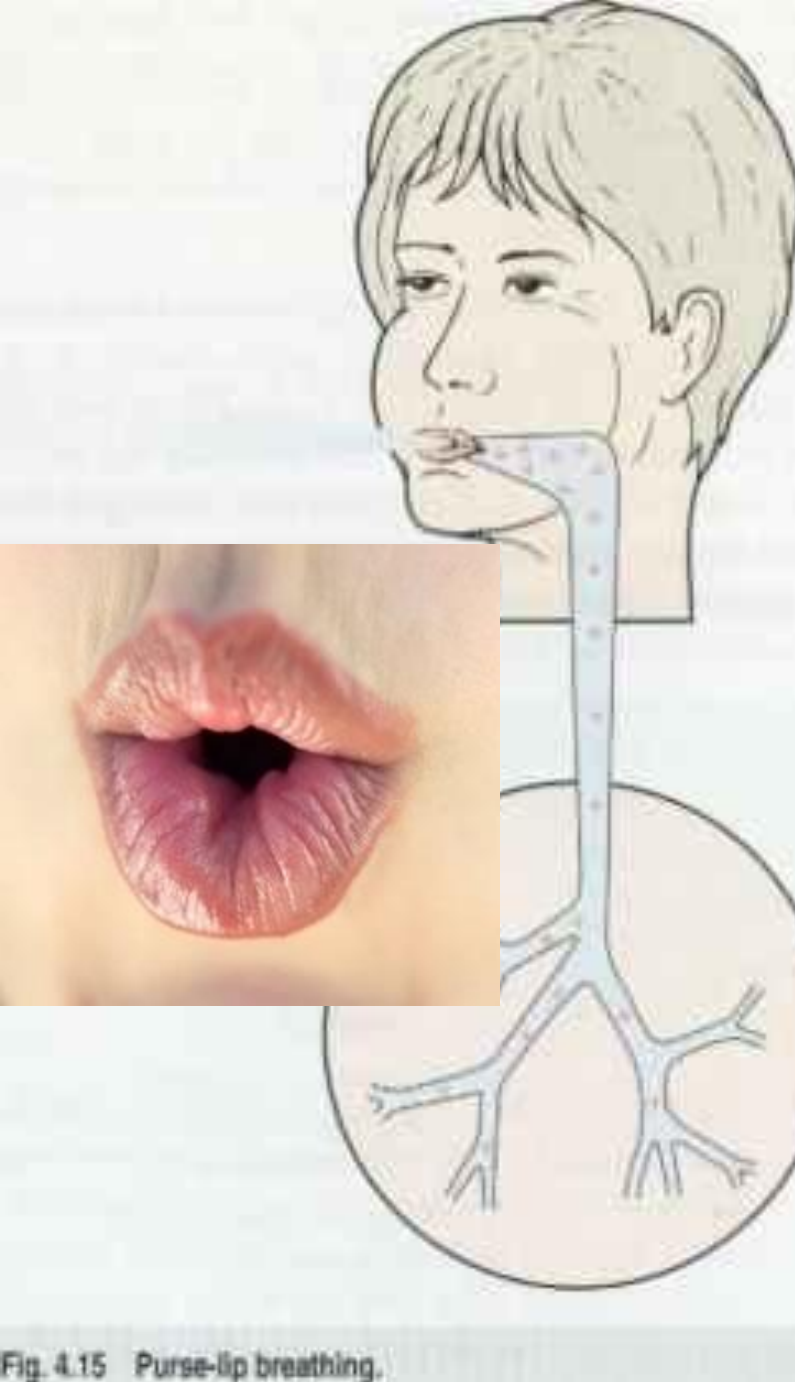


Pursed lip breathing (PLB)



Pursed lip breathing (PLB) is the **breathing** technique that consists of exhaling through tightly pressed (**pursed lips**) and inhaling through nose with mouth closed.

The **purpose** of PLB is to create back-pressure inside airways prevent them to collapsed or closed



What are the advantages of lip pursing

1. Releases trapped air in the lungs
2. Keeps the airways open longer and decreases the work of breathing
3. Prolongs exhalation to slow the breathing rate
4. Improves breathing patterns by moving old air out of the lungs and allowing for new air to enter the lungs

Fig. 4.15 Pursed-lip breathing.



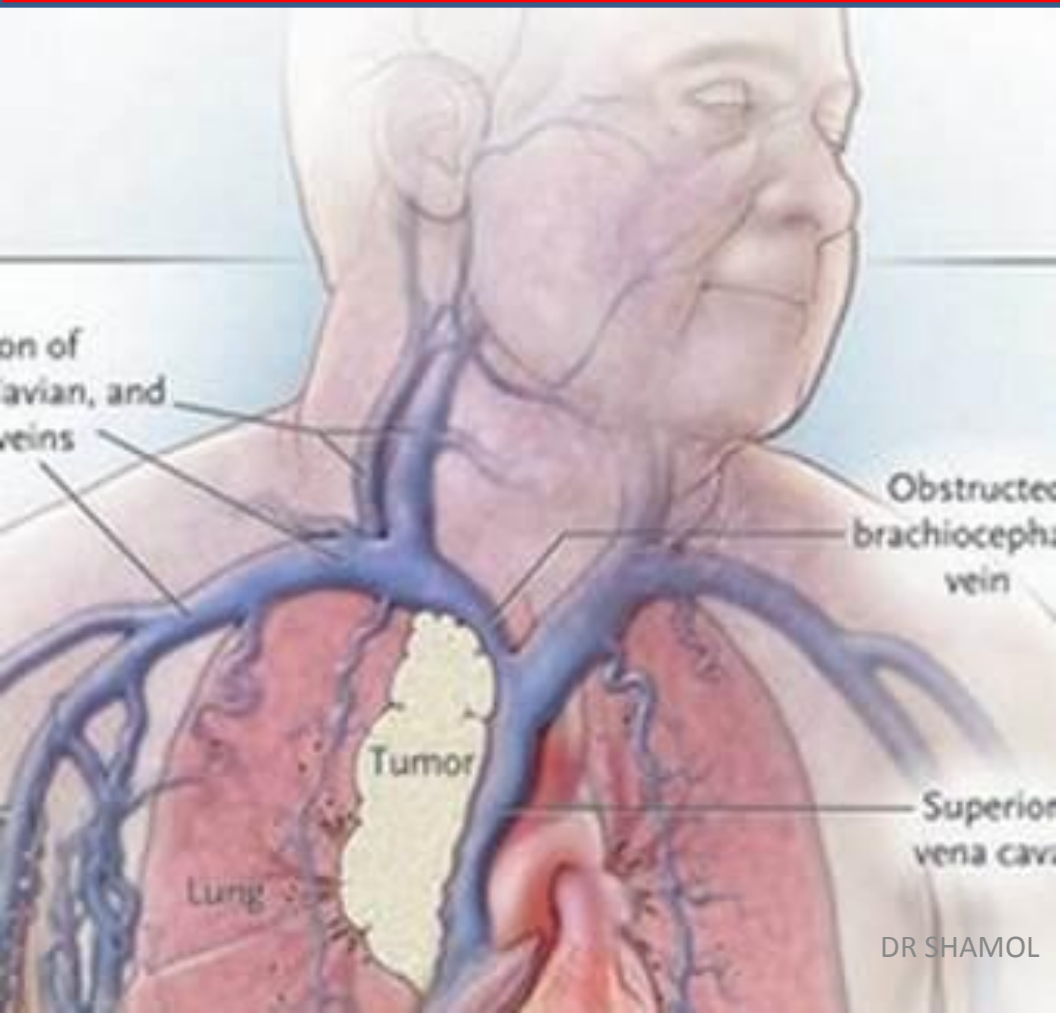
engorged neck vein

**prominence of accessory
muscle of respiration**



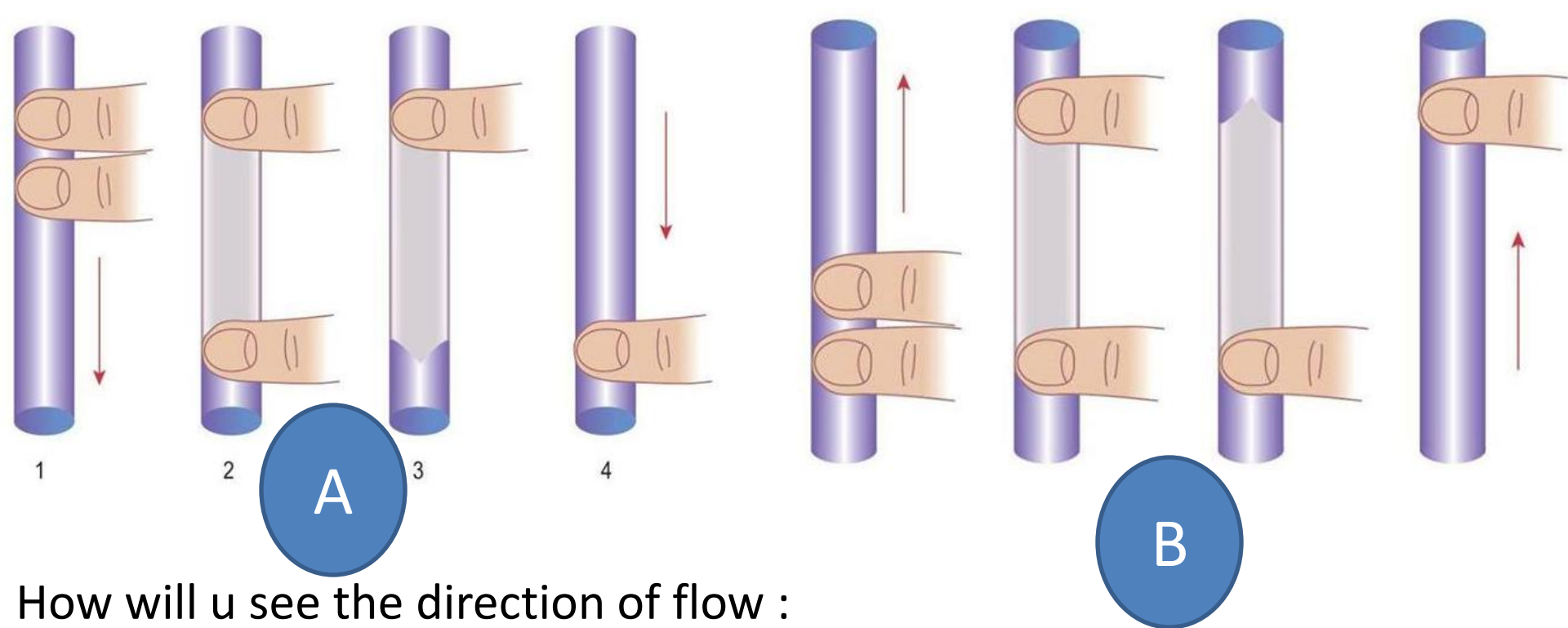
Prominence of respiratory muscle

• Neck swelling –SVO





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How will u see the direction of flow :

Place 2 fingers at one end of the vein and apply occlusive pressure
Move 1 finger along the vein, emptying that section of blood in a milking action.

Release the pressure from one finger and watch for flow of blood back into the vein.

Repeat, emptying blood in the other direction.

Note in which direction the blood return quickly ---that direction is the direction of flow for that patient.

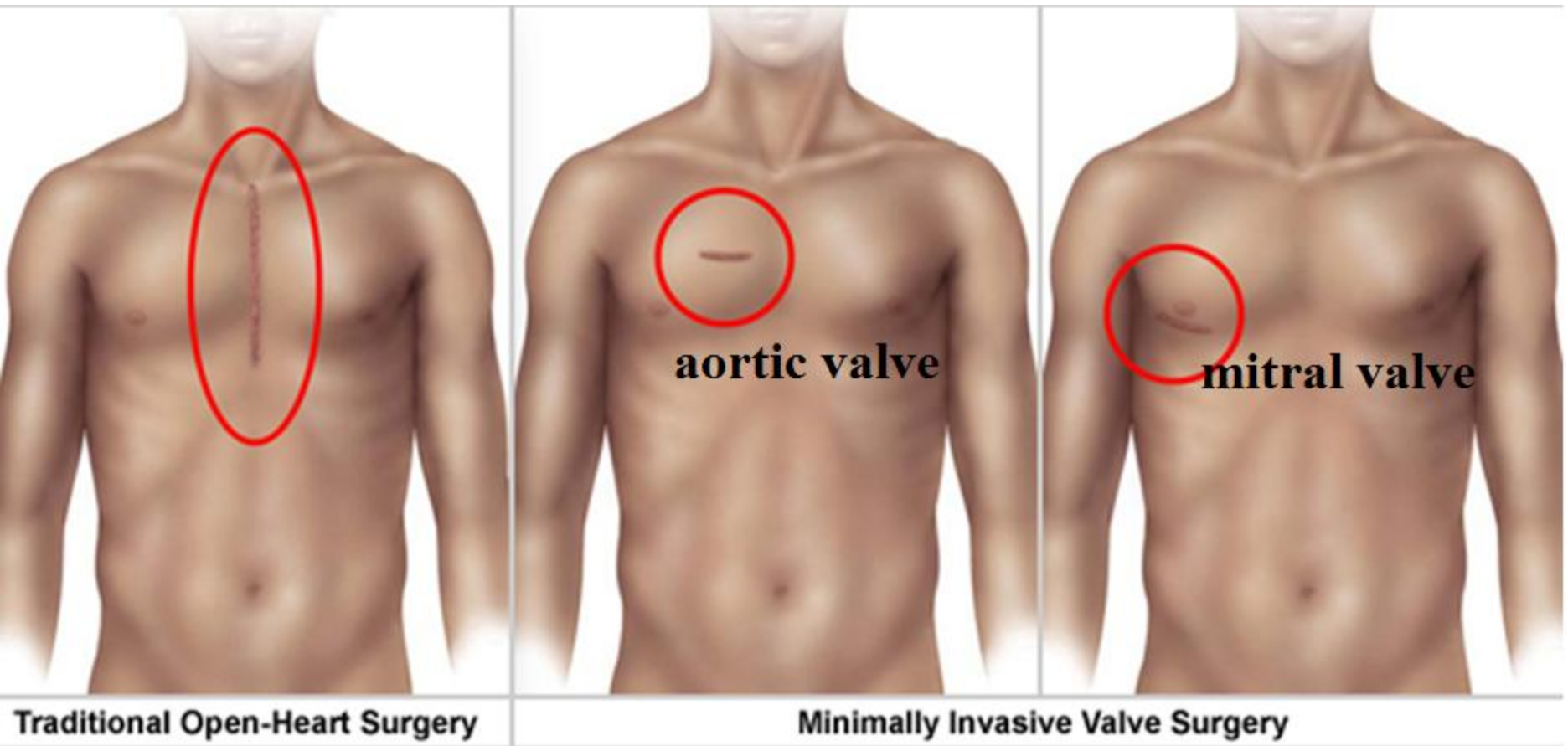


Spider nevi



gynecomastia

SCAR MARKS



Chest Wall Scar Locations

1. Left thoracotomy

- ❑ L Blalock-Thomas-Taussig shunt
- ❑ PDA ligation
- ❑ Coarctation repair

2. Right thoracotomy

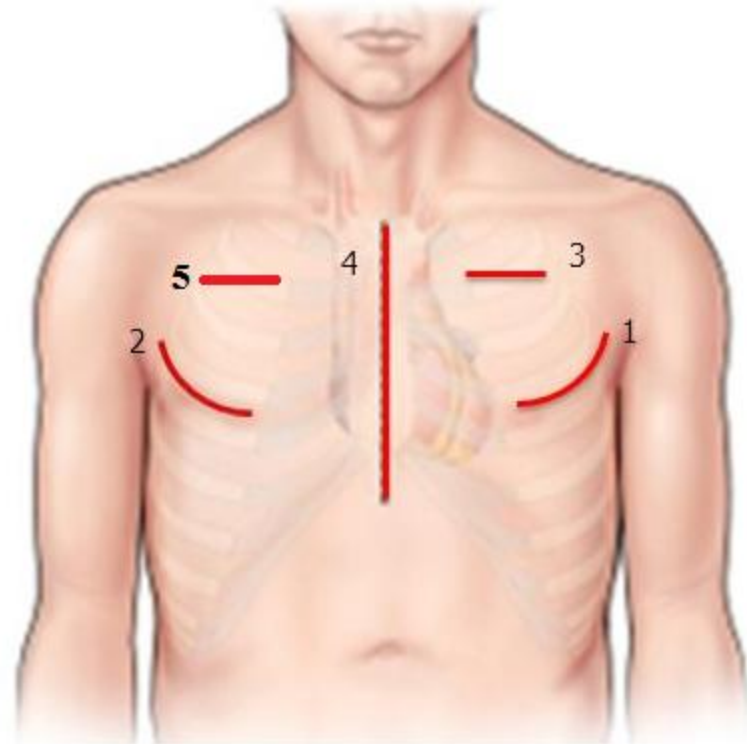
- ❑ R Blalock-Thomas-Taussig shunt
- ❑ Mitral valve repair
- ❑ Some ASD repairs

3. Left upper chest

- ❑ Pacemaker/ICD

4. Median sternotomy

- ❑ Most other cardiac surgeries or require bypass



5. Aortic valve surgery

RESPIRATORY RATE AND RHYTHM, PATTERN



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wikiHow to Check Someone's Breathing Rate (Rate of Respiration)

Normally 14-18/min

Increased rate is called Tachypnoea > 20 / min and

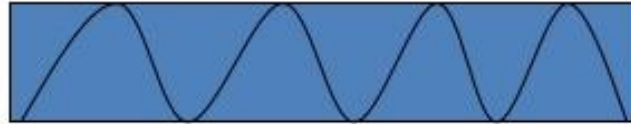
Increased depth is called Hyperpnoea

Decreased rate or slow respiration is called bradypnea

Inspection: Breathing patterns

Rate

- Eupnea
 - Normal
 - 12-20 / min



- Tachypnea
 - ↑ rate
 - Pnuemonia, pulm edema, acidosis, septicemia, pain



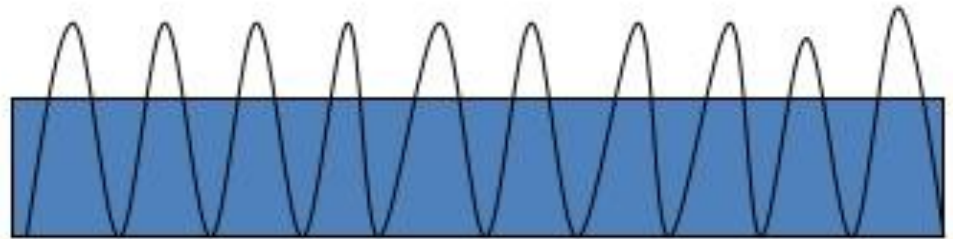
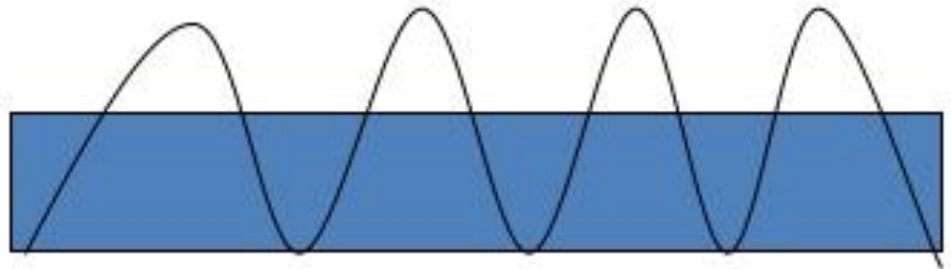
- Bradypnea
 - ↓ rate
 - ↑ ICP, drug Over dose



Inspection: Breathing patterns

Depth

- Hyperpnea
– \uparrow depth
- Hyperventilation
– \uparrow depth & rate
- Hypoventilation
– \downarrow depth & rate



Cause of tachypnoea	Physiological <ul style="list-style-type: none"> • Anxiety • Exercise Pathological cause <ul style="list-style-type: none"> • RTI (pneumonia and others) • Bronchial asthma , COPD , pulmonary embolism • Fever • Metabolic acidosis (DKA, uremia) • LVF • Function • CVA
Cause of hyper apnea	Metabolic acidosis <ul style="list-style-type: none"> • DKA • Uremia
Decreased respiratory rate / bradypnea	<ul style="list-style-type: none"> • Opioid toxicity, • Hypothyroidism, • Raised intracranial pressure, • Hypothalamic lesions, and • Hypercapnia.

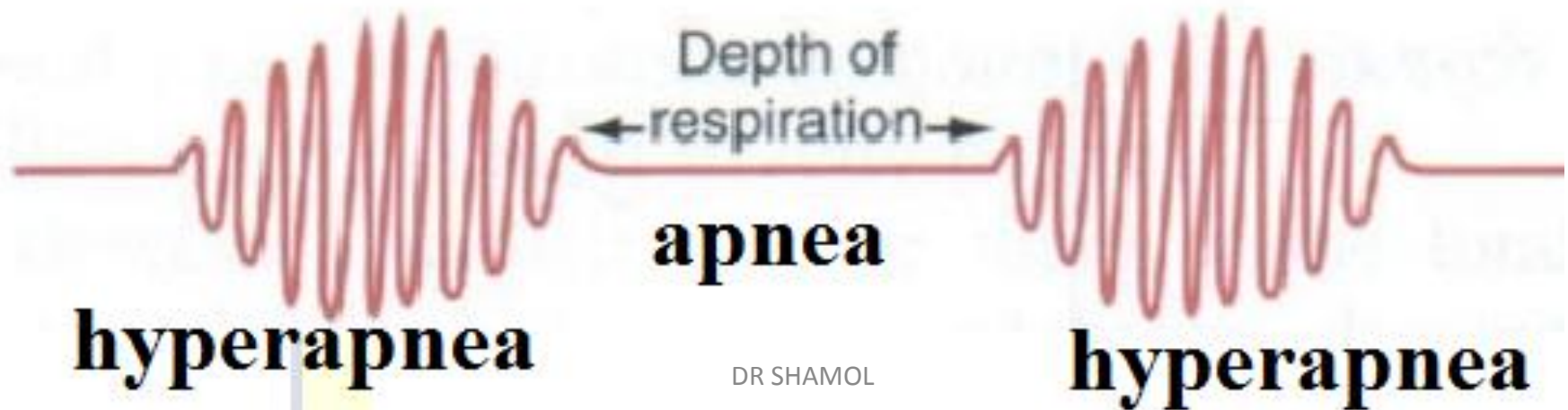
Cheyne stokes breathing

Cheyne-Stokes breathing is cyclical or periodic respiration is characterized by a period of increasing rate and depth of breathing followed by diminishing respiratory effort and rate, usually ending in a period of apnoea or hypopnoea. Then repetition of this cycle. It occurs due to diminished sensitivity of respiratory center to CO_2 .

Cause

- Brain stem stroke,
- Severe cardiac failure./LVF
- Coma
- Necrotic poisoning

May be during sleep in the elderly.

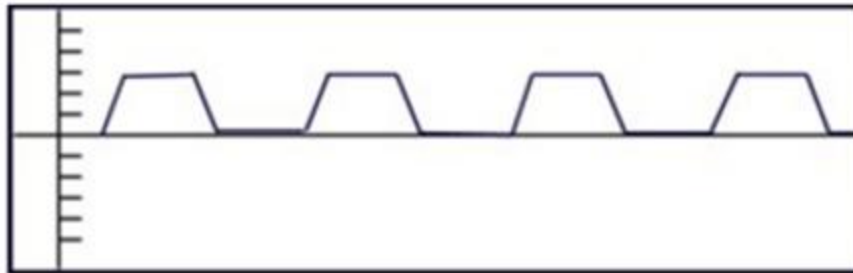


Apneustic Breathing:

An apneustic breathing pattern has prolonged inspiratory phases with each breathe, followed by a prolonged expiratory phase that is often mistaken for an apneic period.

Causes:

Damage to the upper part of the pons,



- prolonged inspiratory phases with each breathe, followed by a prolonged expiratory phase (which resemble as apnea)

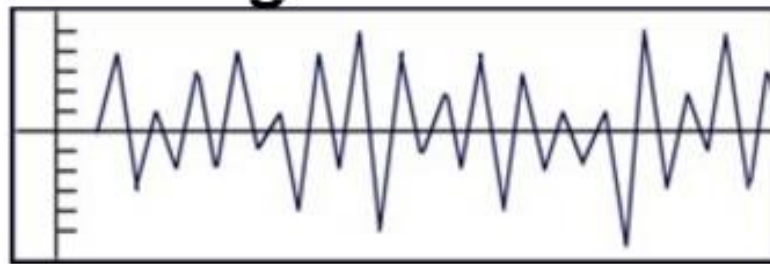
Ataxic breathing

Definition

it is characterized by irregular respiration in time and depth

Cause

medulla oblongata damage –CVA or head injury



- A completely irregular breathing pattern with irregular pauses and unpredictable periods of apnea.
- Cause: lesion to the medulla oblongata secondary to trauma or stroke.

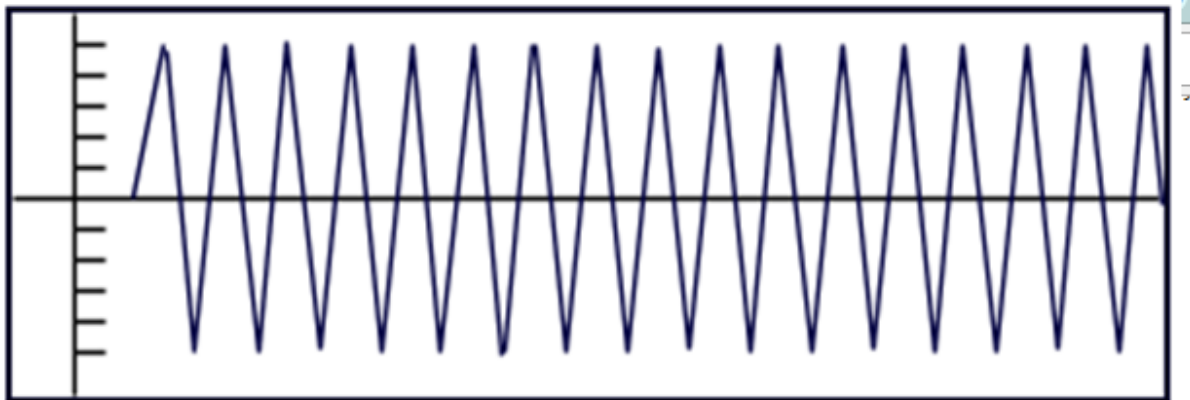
Kussmaul respiration

Kussmaul respiration

It is deep, sighing and rapid respiration at regular rate due to stimulation of respiration centre by $\downarrow P^H$

Cause metabolic acidosis

K-DKA, U-uremia, SS—salicylic acid Mu--methanol poisoning . L- lactic acidosis



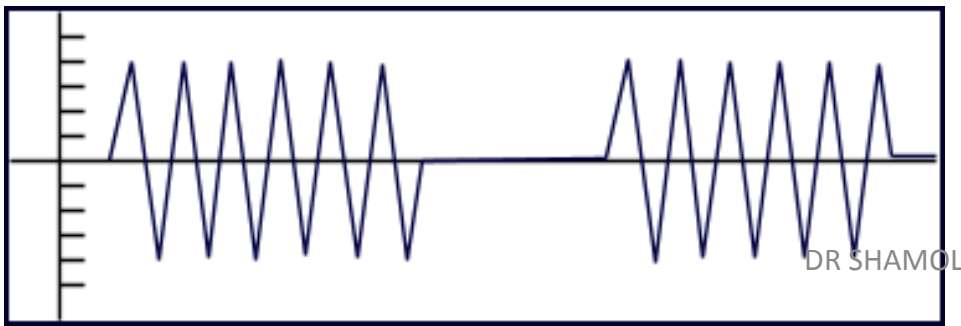
Labored hyperventilation characterized by a deep and rapid respiratory pattern

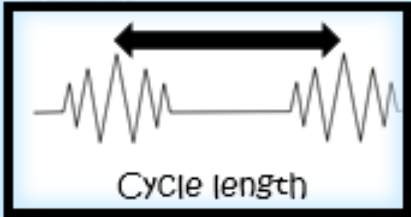

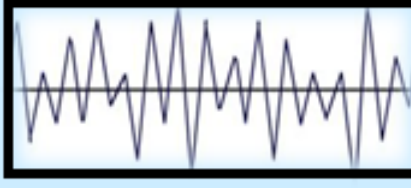

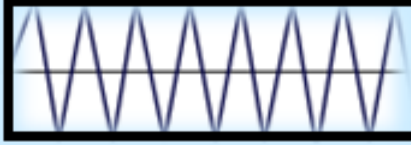
Biot's Breathing

Biot's breathing is characterized by periods, or "clusters", of fairly rapid respirations of close to equal depth followed by regular periods of apnea that can last between 15 seconds to 120 seconds.

Biot's breathing is very similar to Cheyne-Stokes except the spontaneous tidal volume is equal throughout the period of respiration.

Causes: Biot's breathing is usually caused by damage to the medulla oblongata by stroke (CVA) or trauma, or pressure on the medulla due to uncal or tentorial herniation. Biot's breathing can also be caused by prolonged opioid abuse



Breathing pattern	Diagram	Definition	Damage in
Cheyne-Stoke		Gradually increasing breathing depth until it peaks then slowly decreases to a pause	<ul style="list-style-type: none"> CHF Basal ganglia/thalamus damage e.g. metabolic, trauma, infarction etc.
Apneusis		Prolonged inspiration followed by prolonged expiration (which is often mistaken as apnea)	<ul style="list-style-type: none"> Damage in rostral pons
Ataxic		Irregular breathing with irregular period apnea	<ul style="list-style-type: none"> Damage in Caudal pons
Biot (Cluster)		Rapid & deep respirations with pause in between	<ul style="list-style-type: none"> Damage in medulla
Kussmaul		Rapid and deep respirations	<ul style="list-style-type: none"> Acidosis

Palpation of the chest

In palpation you have to see following

1. **Trachea**
2. **Tracheal tug**
3. **Apex beat**
4. **Chest expansion**
 - a) **Symmetrical expansion** –see with both hand
 - b) **Gross measurement** –with measuring tap

position of the trachea





Step one. First place your index finger and ring finger in sterno-clavicular joint

Step two : place middle finger just supra sternal notch and gently press over trachea and feel it



1. index finger on right sterno-clavicular joint
2. middle finger on trachea
3. ring finger on left sterno-clavicular joint



Step three : Now gently place middle finger in between right sternomastoids muscle and trachea now Measure the distance between it and the right sternomastoids

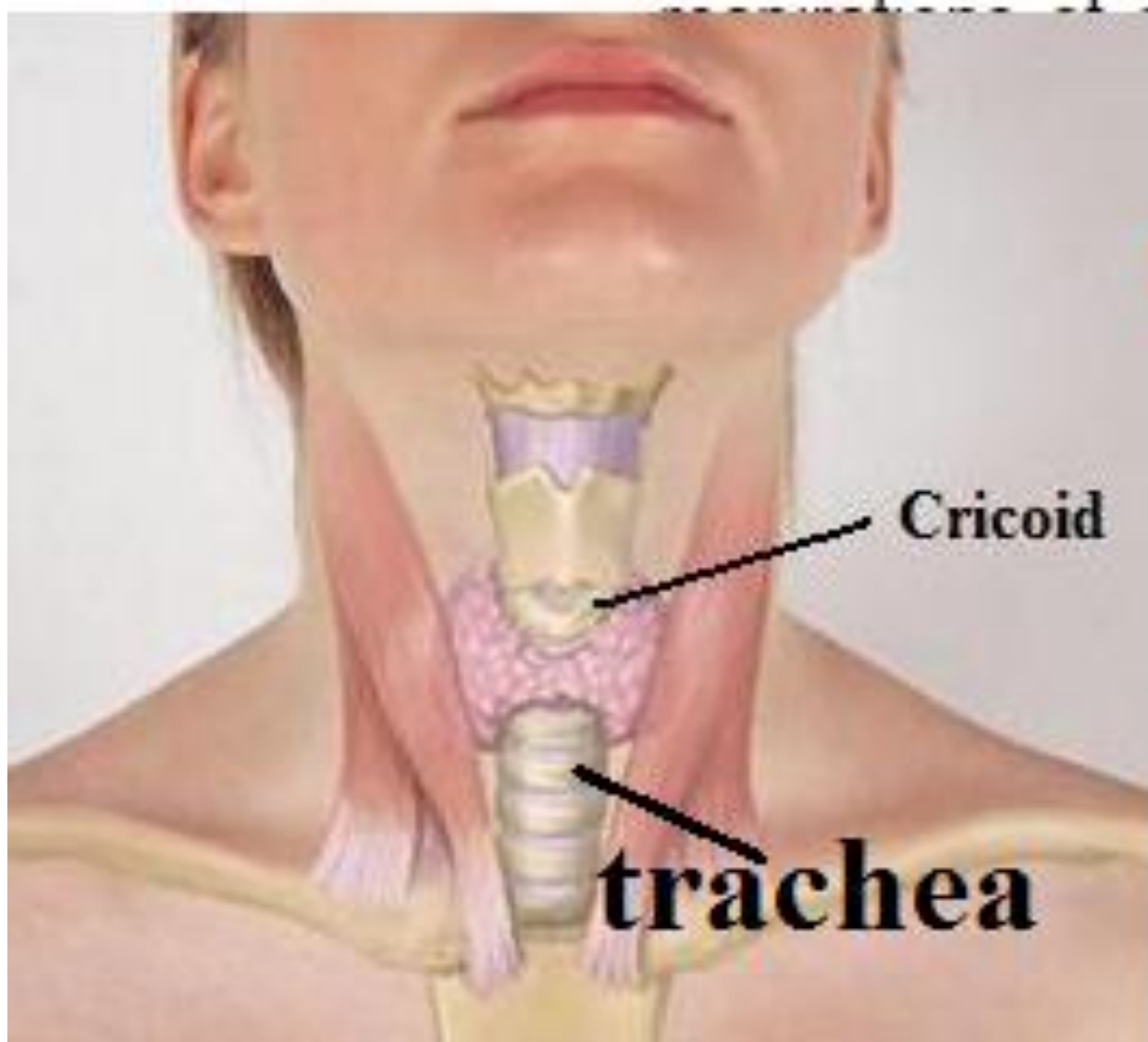
Step four : then do same thing on the left





Step five : Normally this distance is equal in both side

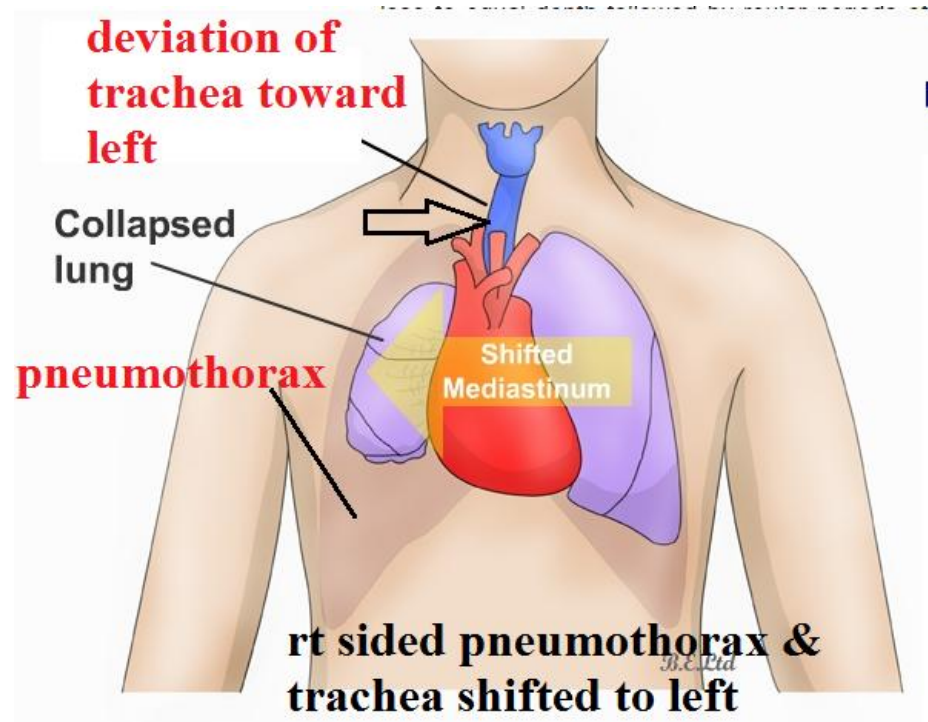
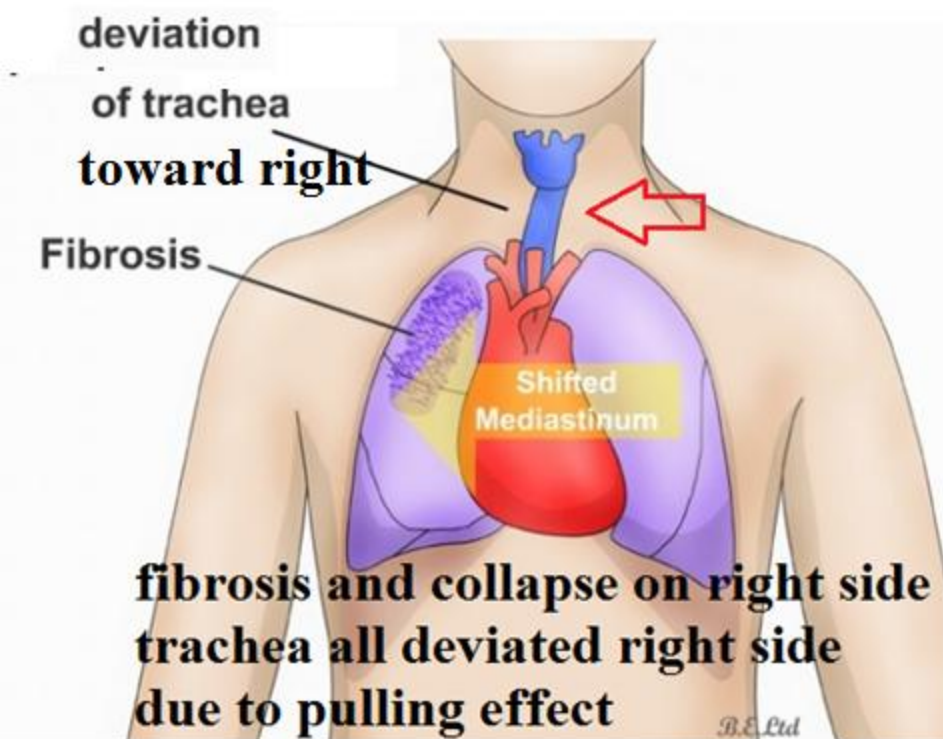
if found that your finger is easily insert right side and feel difficulty or tightness in inserting to left side then ur interpretation will be trachea is shifted to tight side (left)

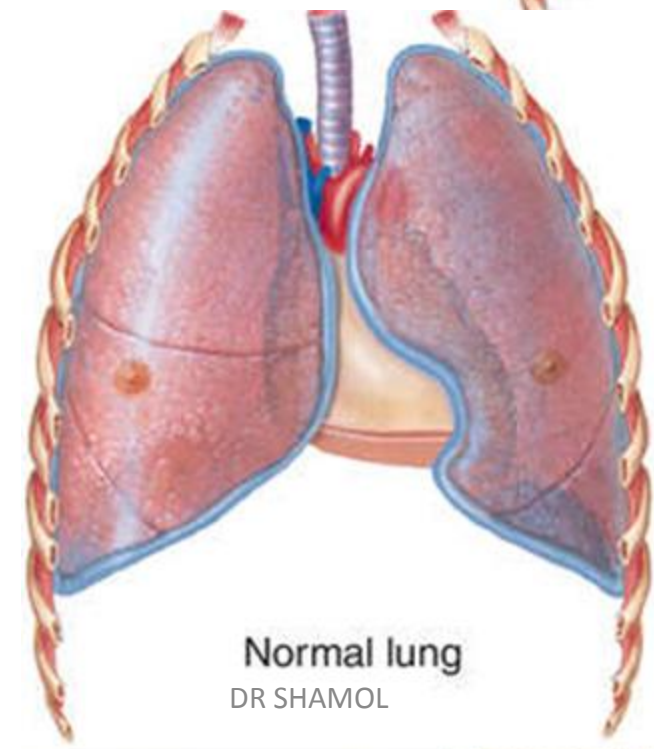
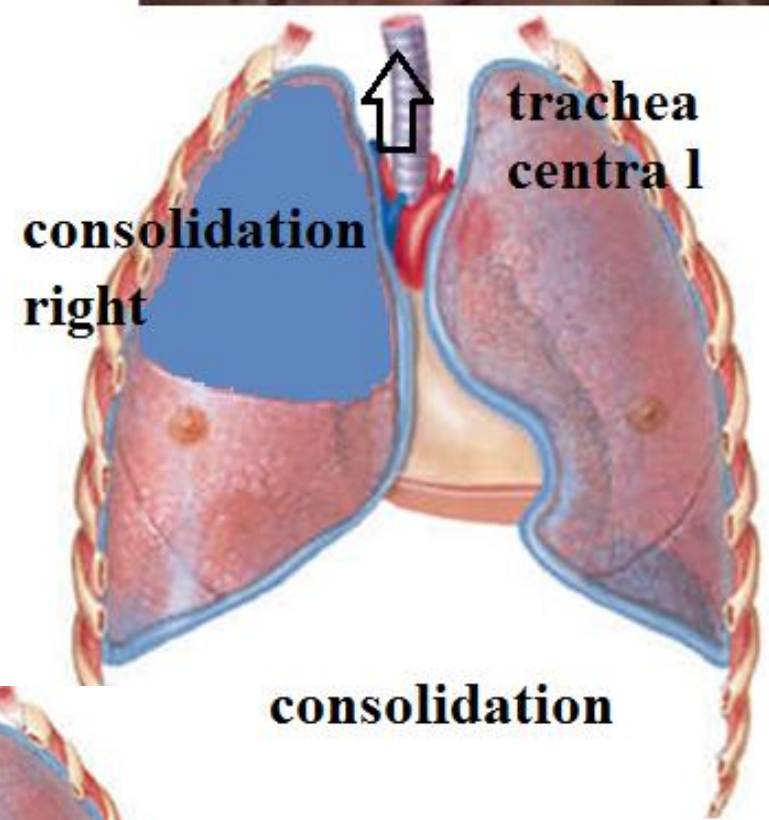
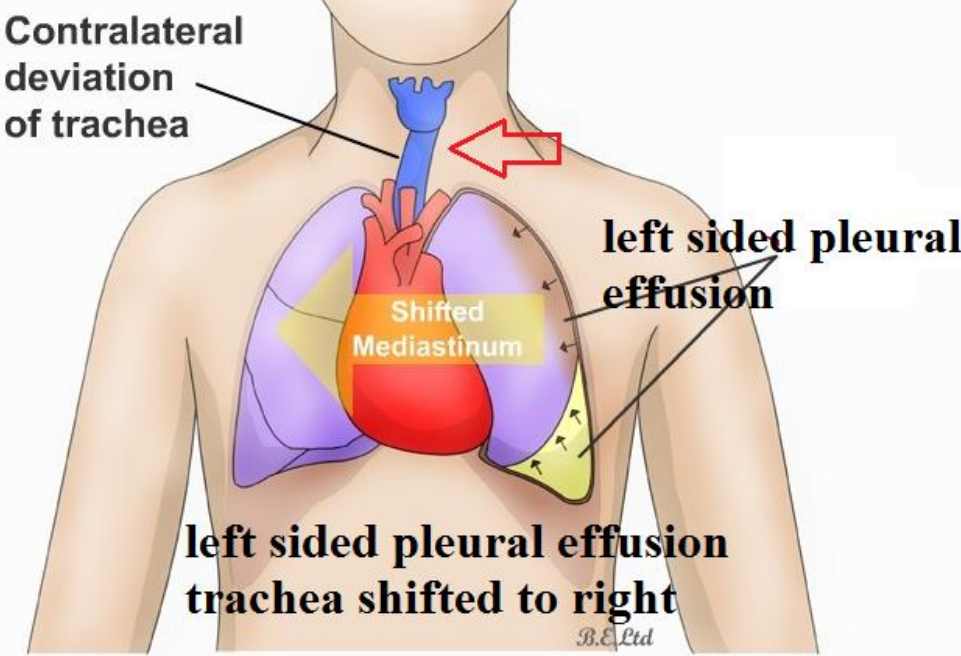


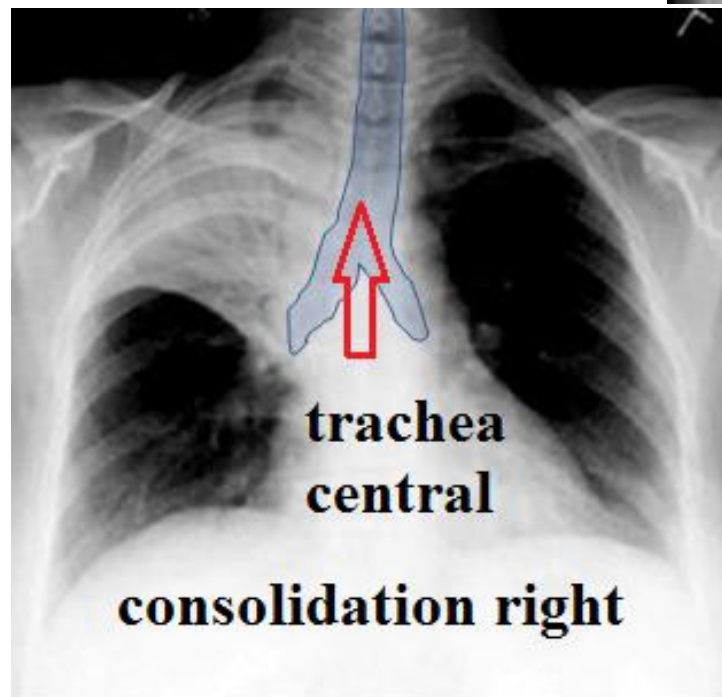
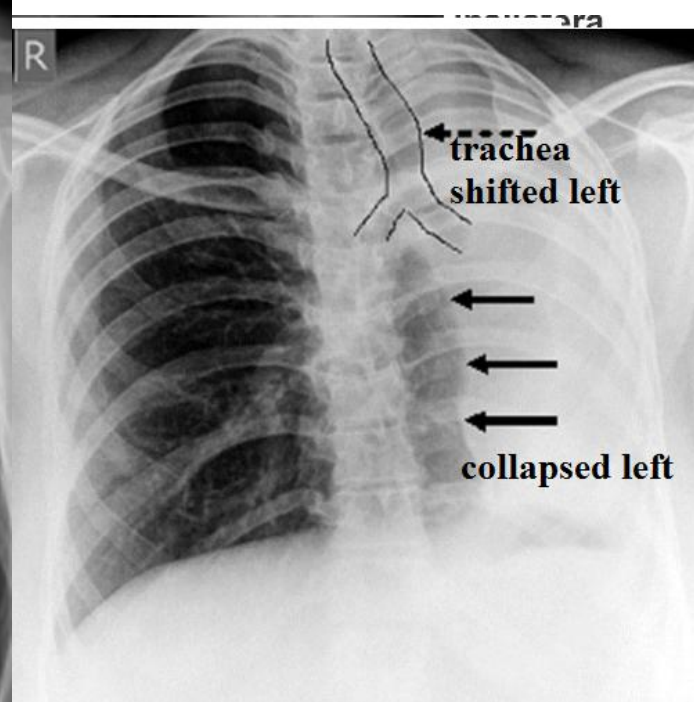
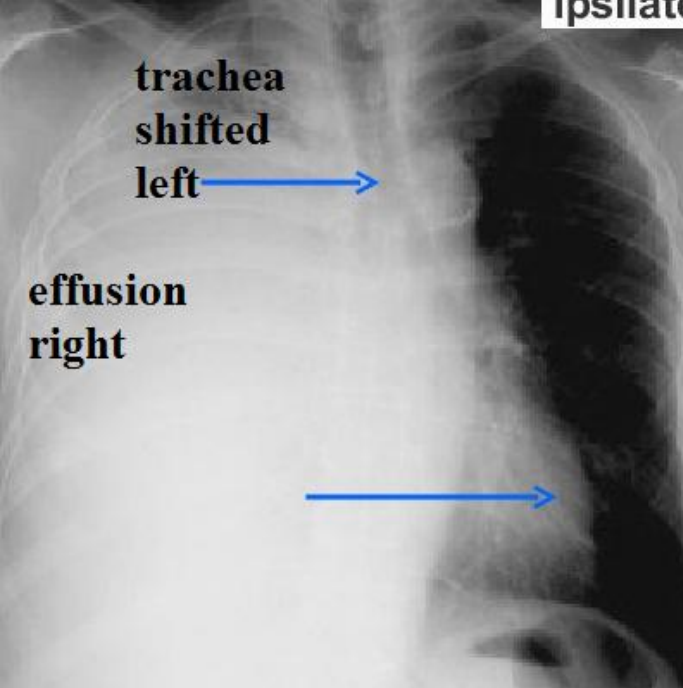
Now interpretation

- Normally: trachea is central and slightly deviated toward the right
- Trachea started from cricothyroid cartilage and bifurcated anteriorly at the level of sternal angle and posteriorly at the level of T₄ vertebra

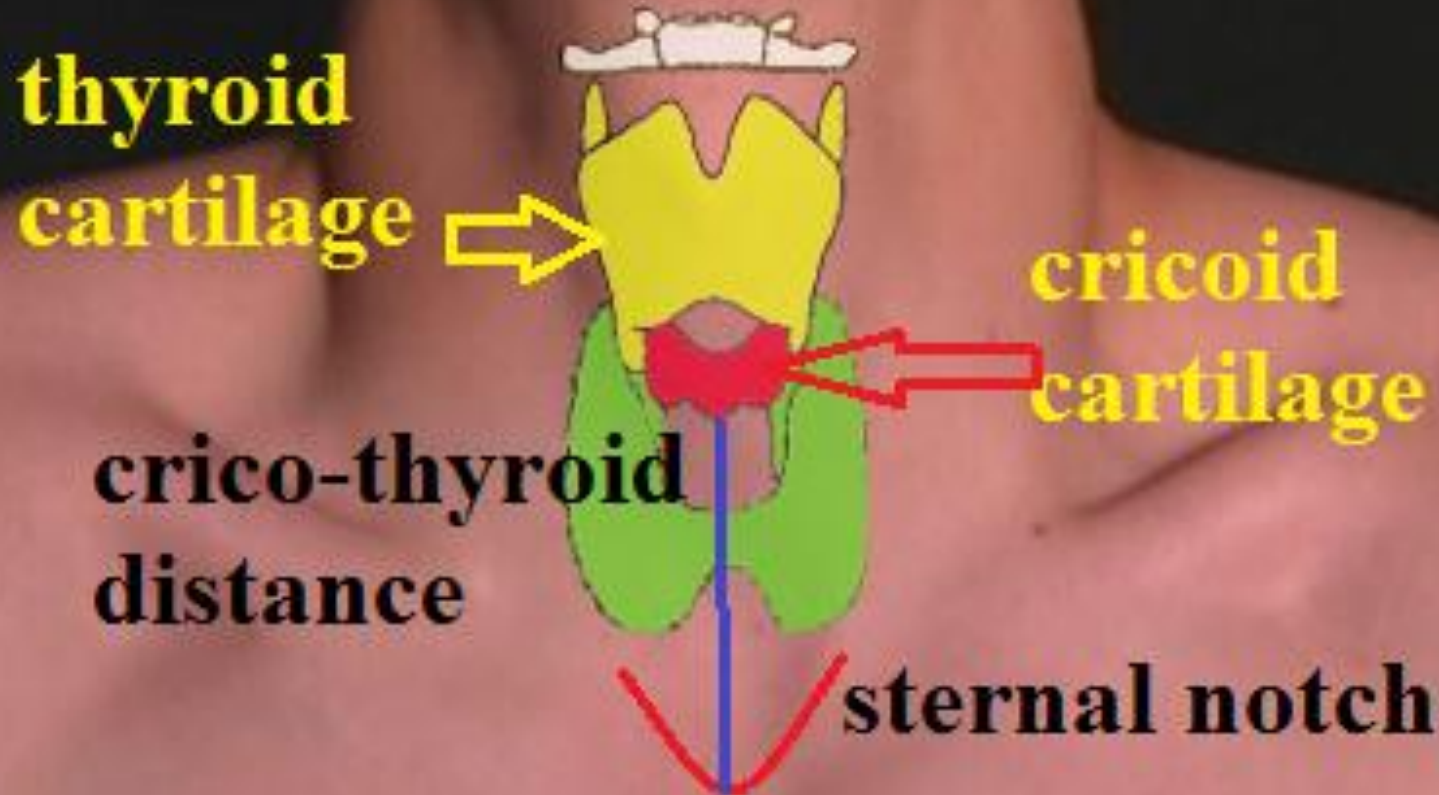
Towards the side of the lung lesion / pulling	<ul style="list-style-type: none"> • Central 	Away from the side of the lung lesion / push
<ul style="list-style-type: none"> • collapse • fibrosis • Pneumectomy 	<ul style="list-style-type: none"> • In normal • Consolidation 	<ul style="list-style-type: none"> • Tension pneumothorax • Massive pleural effusion



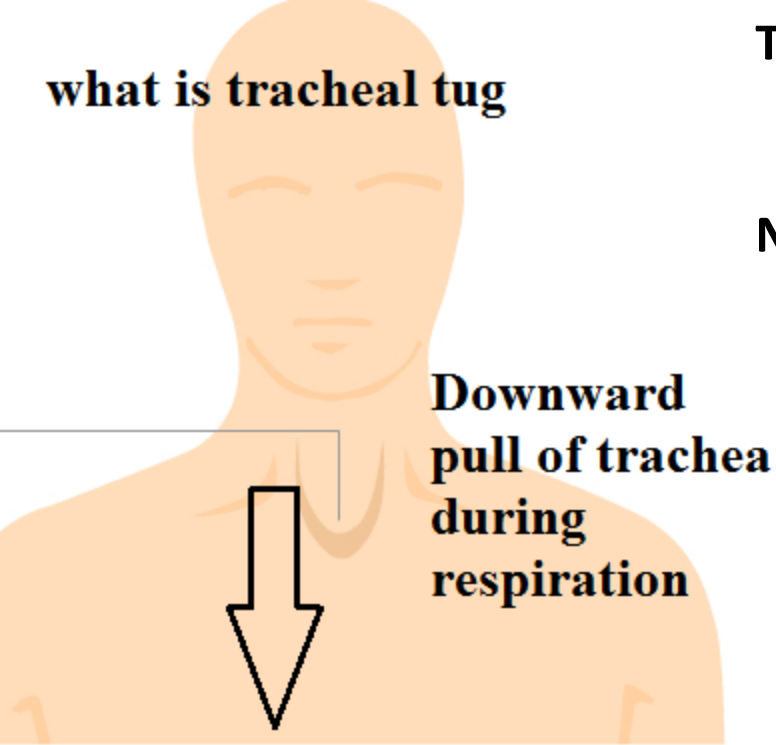




TRACHEAL TUG



what is tracheal tug



TRACHEAL TUG:

Descend of trachea during inspiration Is called tracheal tug . it indicate hyper inflation of lung

Normally:

The distance between the suprasternal notch and cricoid cartilage is normally three to four finger breadths. (Crico-sternal distance)

Reduction in this distance suggests lung hyperinflation or 'tracheal tug'

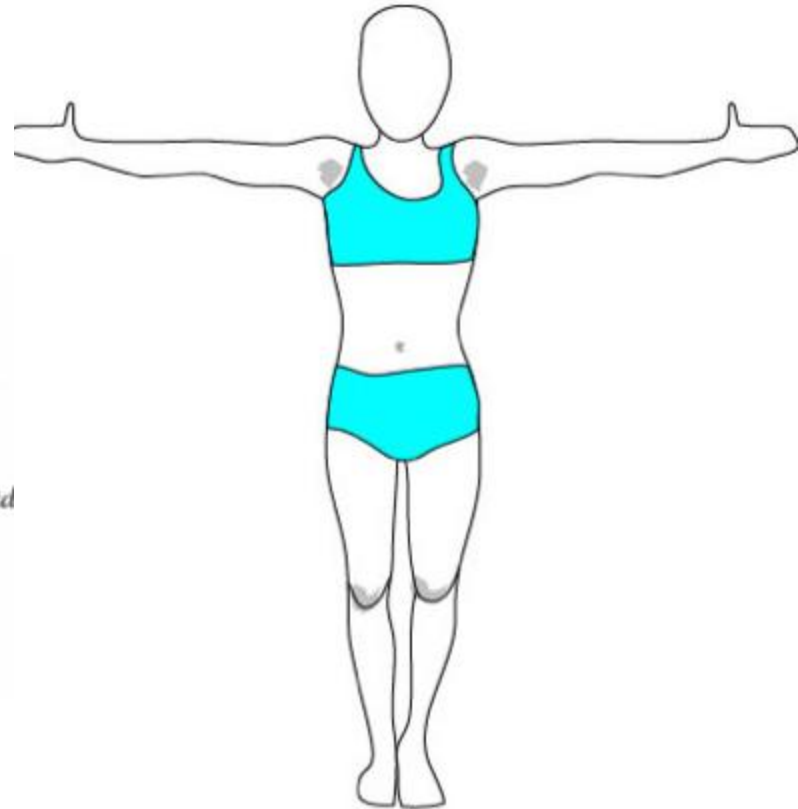
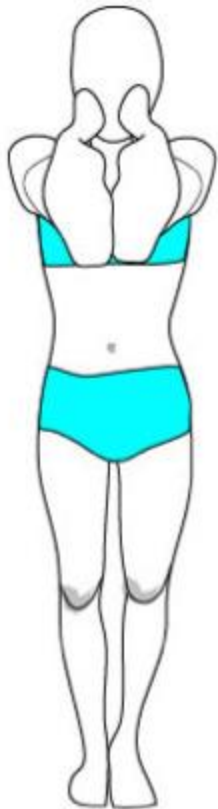
. How will you measure the tracheal tug:

1. Place three finger over trachea
2. Ask the patient to take deep breath while u r resting finger on the trachea
3. If patient have hyperinflation trachea will goes downward with each inspiration
4. So cricosternal distance will be less than three finger and u will tell that tracheal tug is present



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Chest expansion



Chest expansion

We see chest expansion in two ways

- With hand ---To see any asymmetrical expansion or restriction
- With measuring tap –total expansibility of chest

Chest expansion



- Measured as the difference between maximal inspiration and maximal forced expiration in the fourth intercostal space in males or just below the breasts in females
- Normal chest expansion is ≥ 5 cm.



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How will u see the expansibility with hand?

Both sides of the thorax should expand equally during maximal inspiration

Usually we see it in three positions

1. At manubrium sternum —To see apical zone / upper

2. At nipple —To see mid zone

3. Just above xiphoid process ----to see lower zone

At apex / upper Zone

Step .1: Place u r both hand firmly (not tightly) on the patient chest in such a position that all the extending fingers remain on the patients on the apex of lung

Step .2. : Now place your thumbs in such way that they touch each other in the mid line at menubrium .

Step 3 : Look care fully that tip of thumbs do no touch the chest wall

Stop 4: Ask the patient to take a deep breath.

Step 5 : As they do this, watch your thumbs

Your thumbs should move symmetrically apart in normal case

If you look that one thumbs is moving less apart from other

Then it indicate that there is reduction expansion of chest on that side





At the middle zone

Step .1: Place u r both hand firmly (not tightly) on the patient mid chest in such a position that all the extending fingers remain on the mid lateral surface of the patients lung

Step .2. : Now place your thumbs in such way that they touch each other in the mid line at Nipple level

Step 3 : Look care fully that tip of thumbs do no touch the chest wall

Stop 4 : Ask the patient to take a deep breath

Step 5 : As they do this, watch your thumbs

Your thumbs should move symmetrically apart in normal case

If you look that one thumbs is moving less apart from other

Then it indicate that there is reduction expansion of chest on that side



DR SHAMOL



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Lower Zone

Step .1: Place u r both hand firmly (not tightly) on the patient lower chest in such a position that all the extending fingers remain on the lower lateral surface of the patients lung

Step .2 : Now place your thumbs in such way that they touch each other in the mid line at xephoid process

Step 3 : Look care fully that tip of thumbs do no touch the chest wall

Stop 4 : Ask the patient to take a deep breath

Step 5 : As they do this, watch your thumbs

Your thumbs should move symmetrically apart in normal case

If you look that one thumbs is moving less apart from other

Then it indicate that there is reduction expansion of chest on that side





DR SHAMOL

Causes of asymmetry of movement

Movement is restricted at
Left side

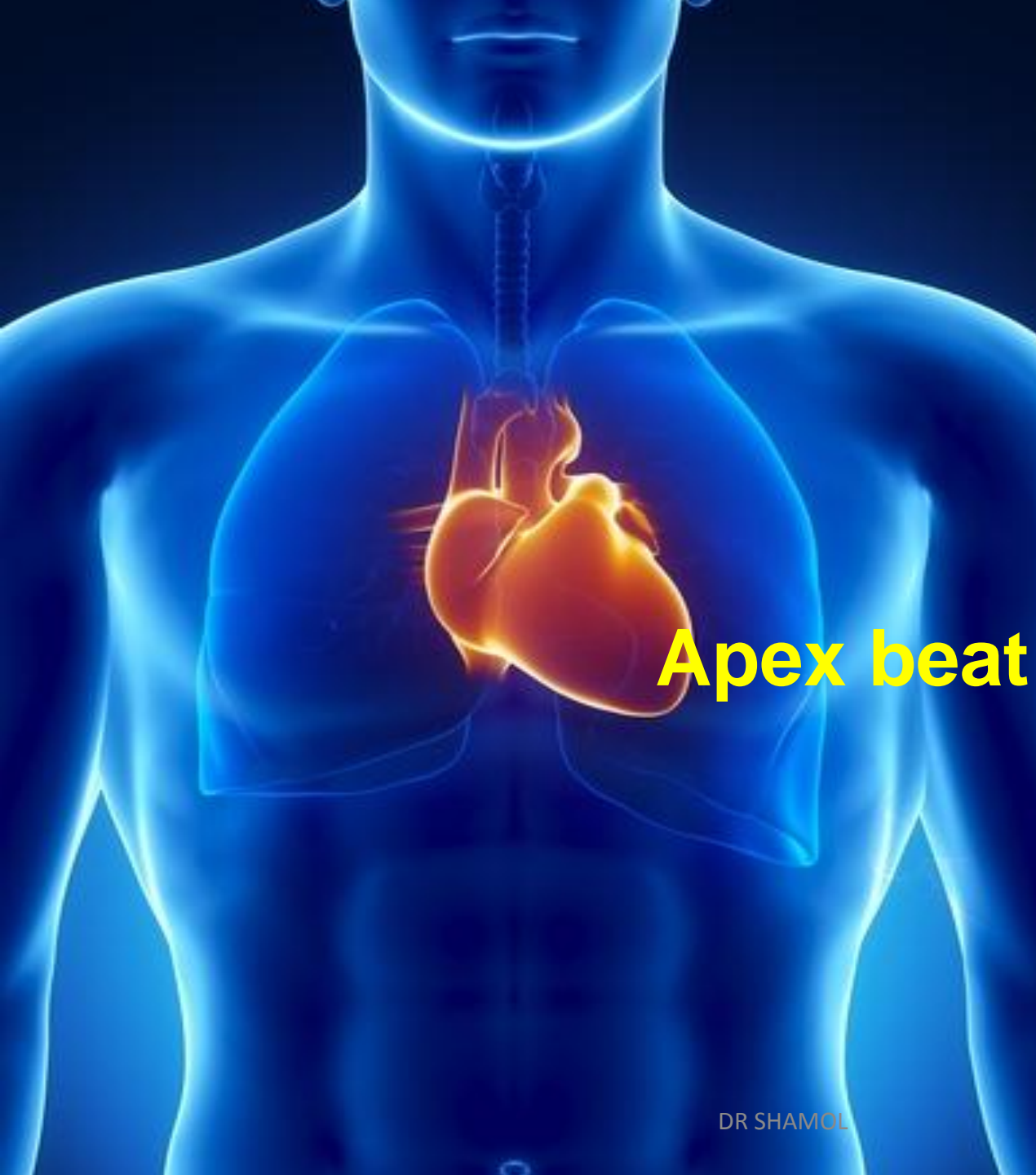
4 cm 0 cm

Cause of unilateral restriction

- Fibrosis
- Collapse
- Pleural effusion
- Pneumothorax
- Consolidation

Cause if bilateral restriction

- Emphysema
- Ankylosing spondylosis



Apex beat



First keep the measuring tap on the bed from your pocket as it will need later to measure distance of apex beat from mid line

Place the flat surface (palm) of your right hand just below the nipple try to feel any cardiac pulsation present or not.



It is better to place the hand more laterally



Now move the hand toward medially to feel and locate the apex



Npw if you feel the apex then localize the apex beat with single finger



Either u got apex beat or not roll the patient left laterally

if u got the apex beat previously then it help u to confirm the apex or
if can not locate the apex it help you to located the apex beat

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Now return the patient in his previous position and localize the apex beat with single finger.

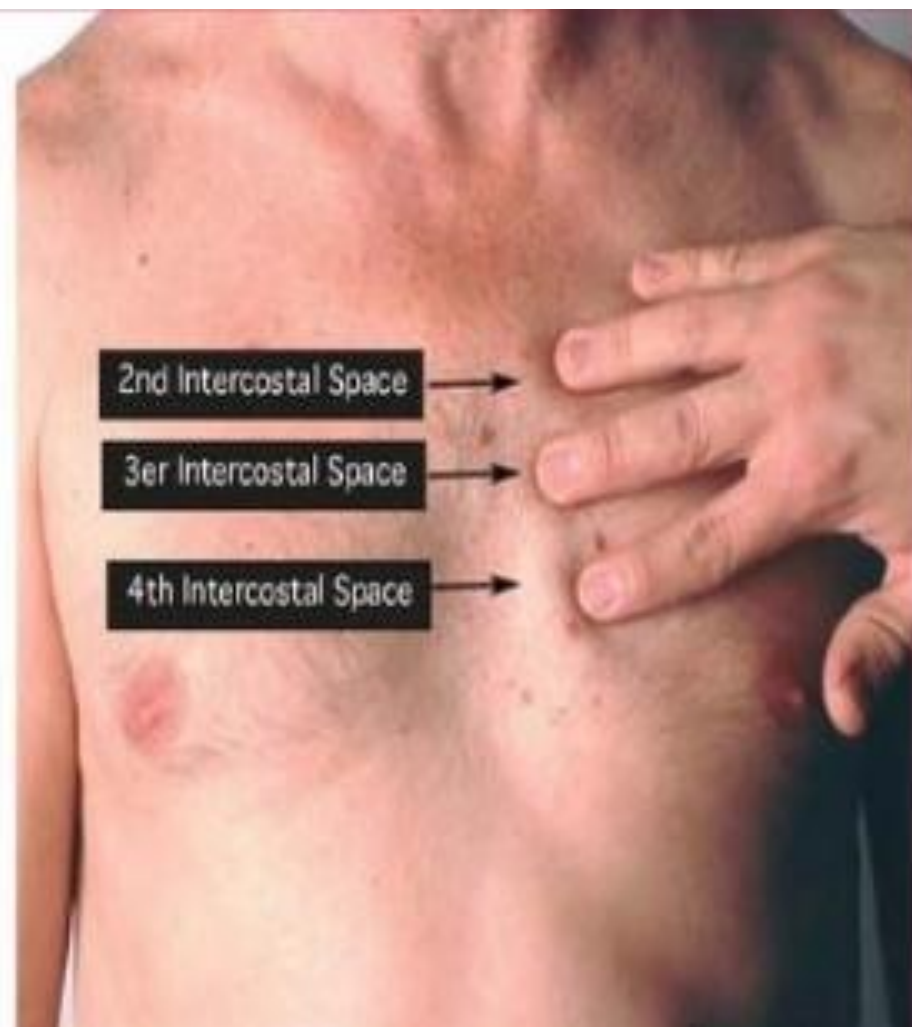
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Now with the thumb or index finger of left hand please first identify the sternal angel .

if u rub your finger from manubrium sternum to downward u will find ridge or elevated area –it is the sternal angle



Go left laterally & you will find 2nd rib and below its 2nd inter costal space and count the space to up to apex beat where your finger is still placed

3RD

2ND

sternal angle

2nd rib
1st ICS





apex beat **5th** **apex beat is in left 5th ICS**

4th ICS

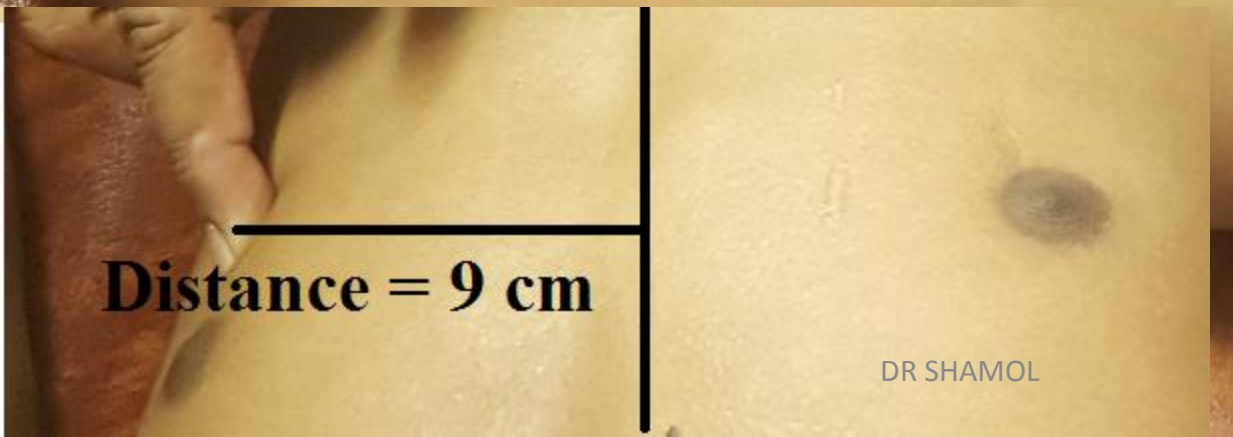
3rd ICS

2nd ICS

2nd rib **sternal angle**
1st inter costal space (ICS)



Now take the measuring tap and measure the distance from mid line to apex beat in cm



Remember we will see site—space,
distance---away from mid line and
character

DISTANCE

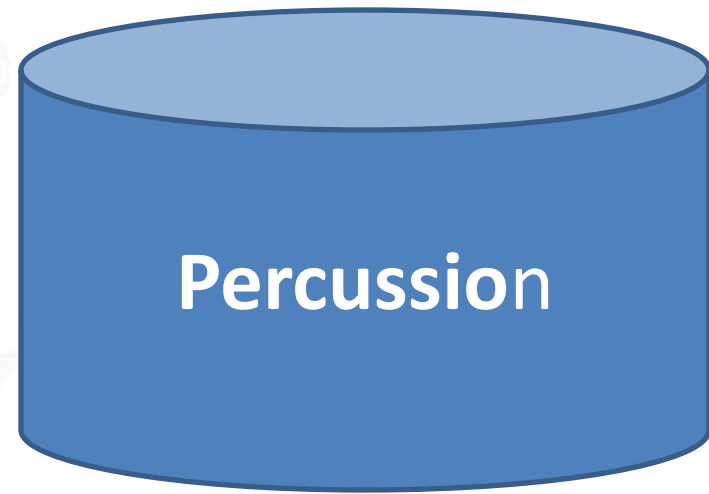
characters

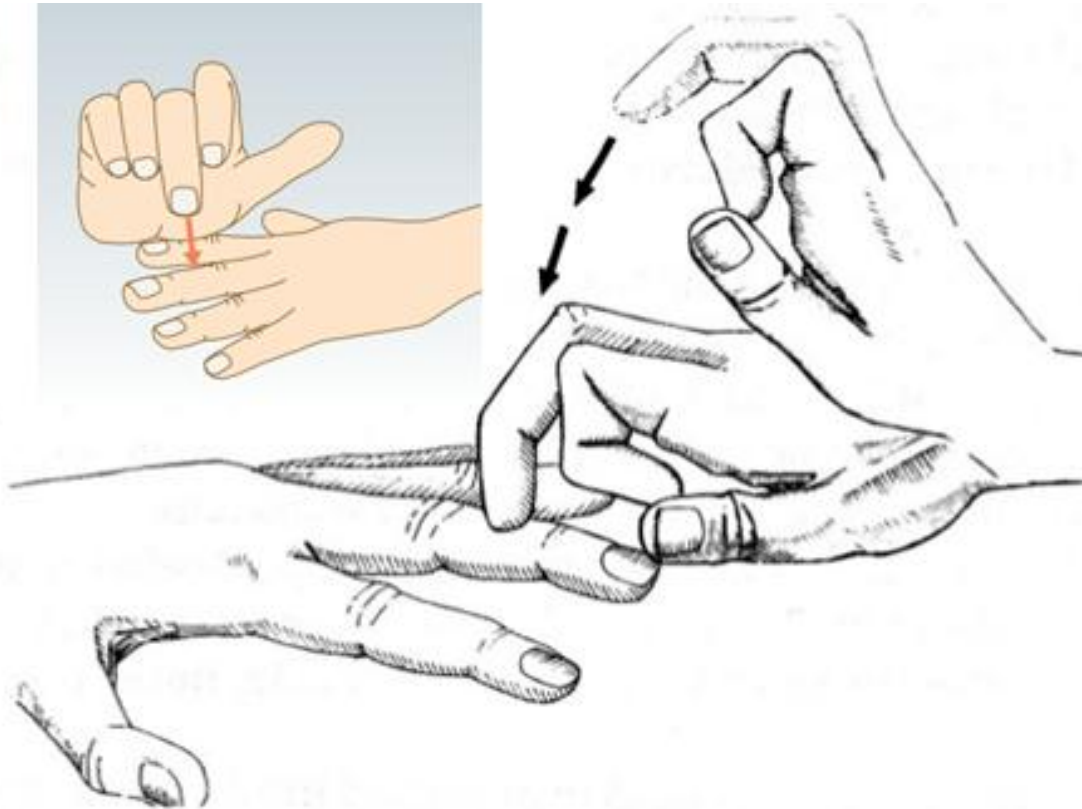
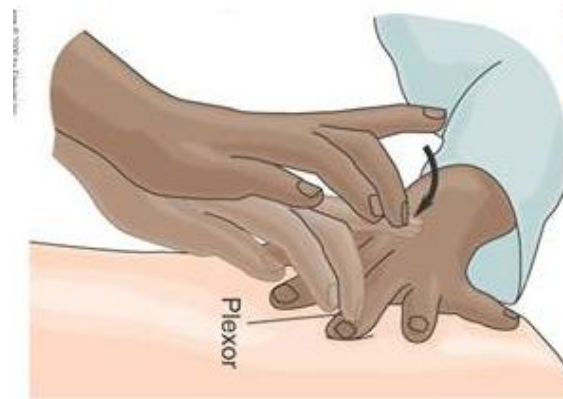
SITE

DR SHAMU limited

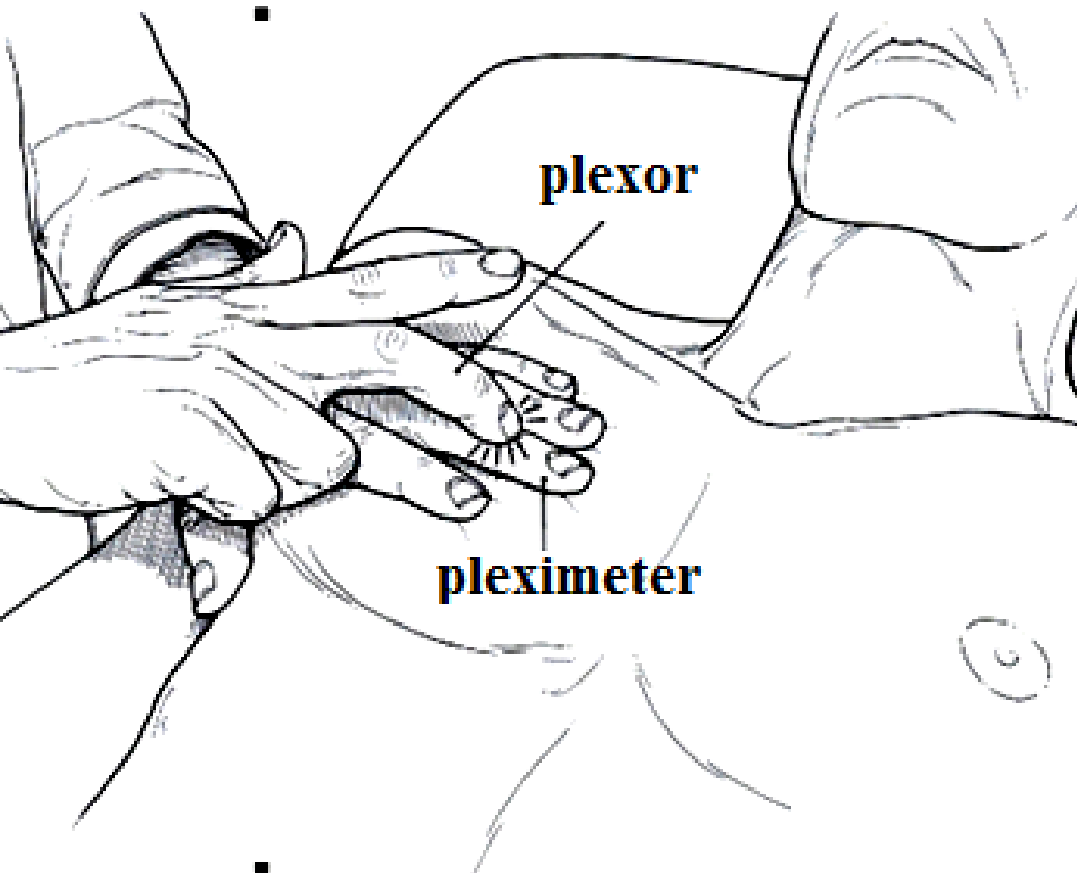
তা ব্যাংক
লিমিটেড







Using the tip of the middle finger of the right hand, strike the centre of middle phalanx of the middle finger of the left hand (The right middle finger should be kept in the flexed position)



Step one –

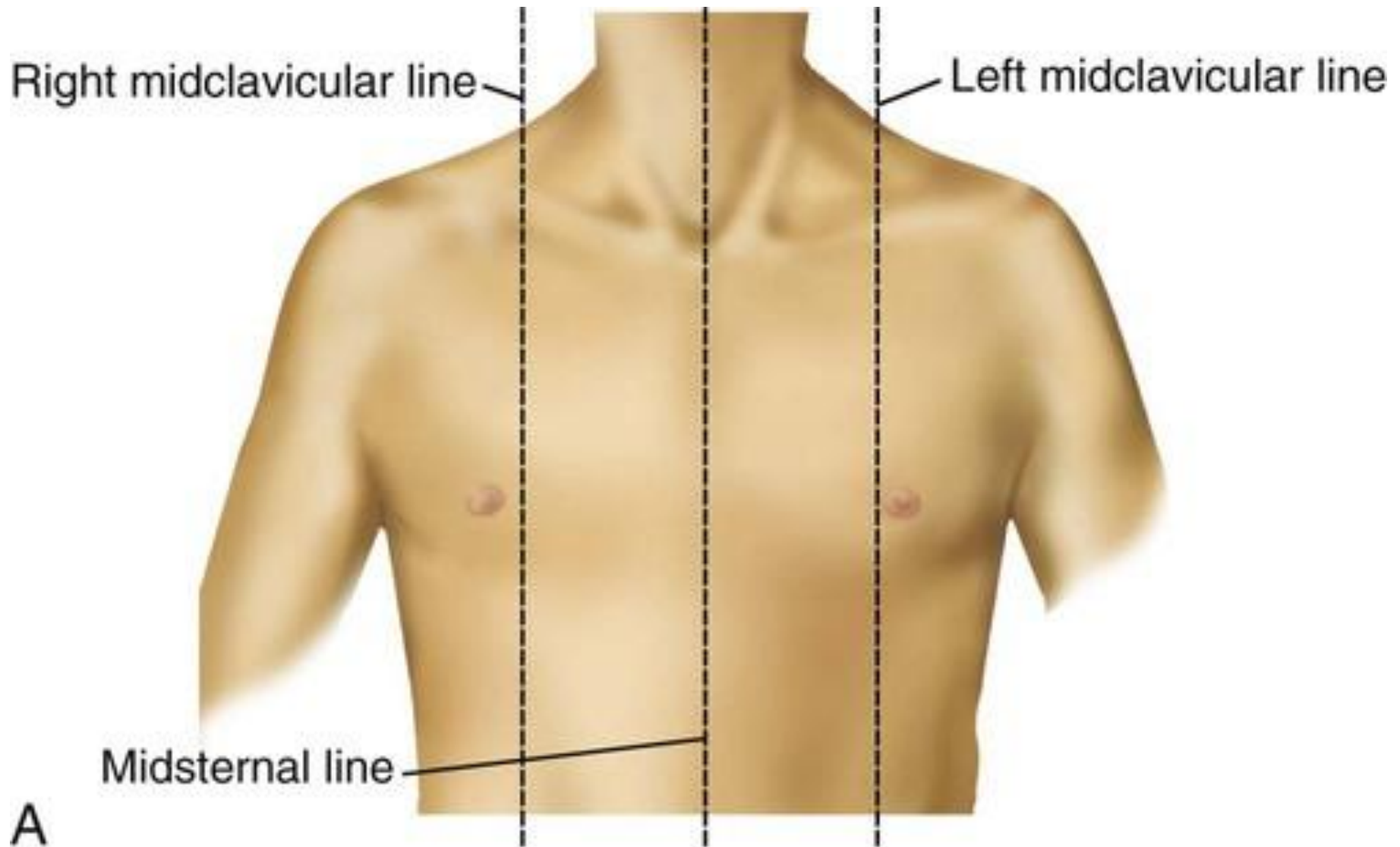
place the palm of your left hand on the chest with fingers separated and lying between the ribs

Step two -- Press the left middle finger firmly against the chest

Step three-- Using the tip of the middle finger of the right hand, strike the centre of middle phalanx of the middle finger of the left hand (The right middle finger should be kept in the flexed position)

Step four –There will be a loose swinging movement arising from the wrist and not the Forearm

Step five--- The striking finger should be moved away again quickly as keeping it pressed on the left hand may muffle the noise



Anterior
axillary line

Midaxillary
line

Left scapular
line

Right scapular
line

Midspinal
line

Posterior axillary
line

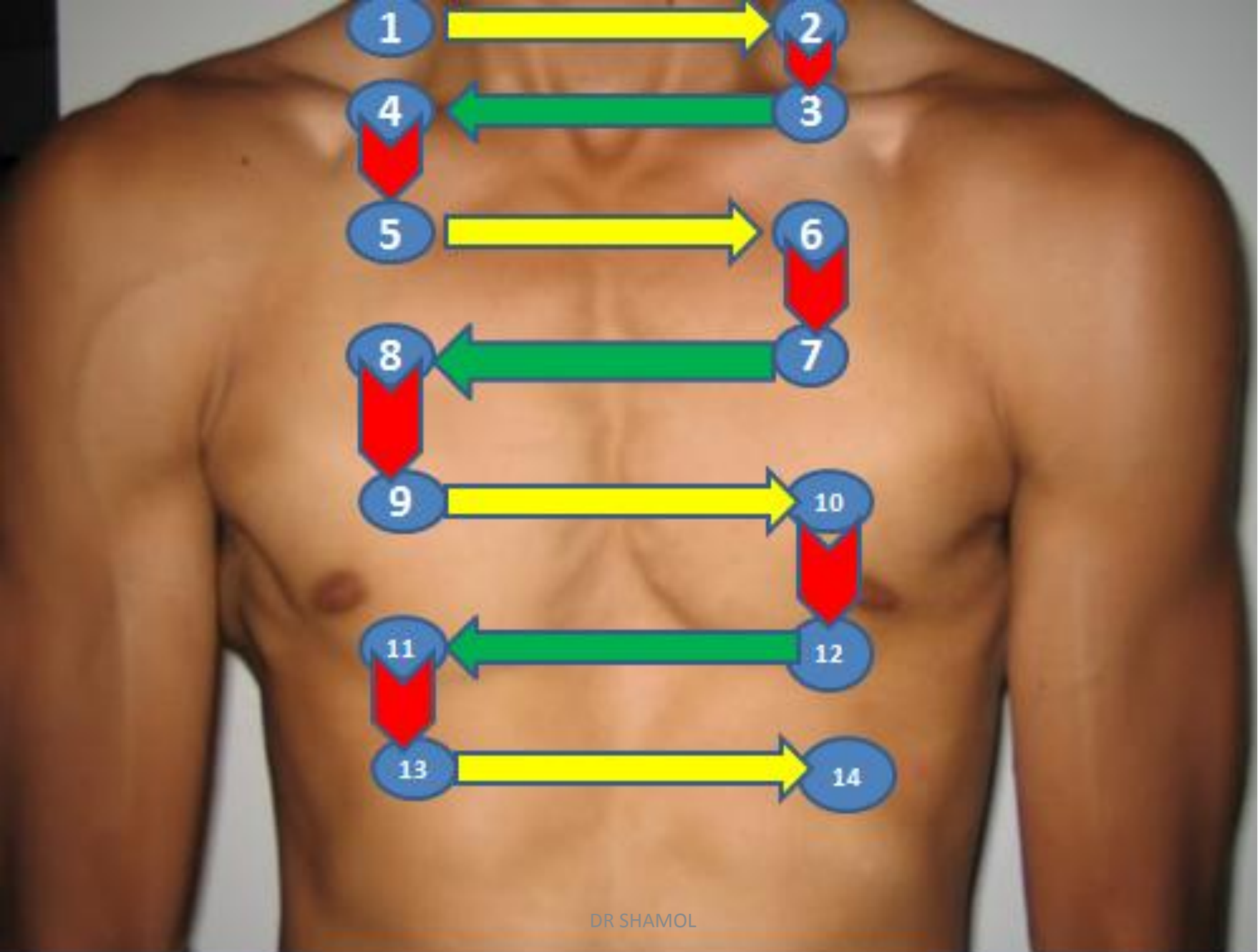
B

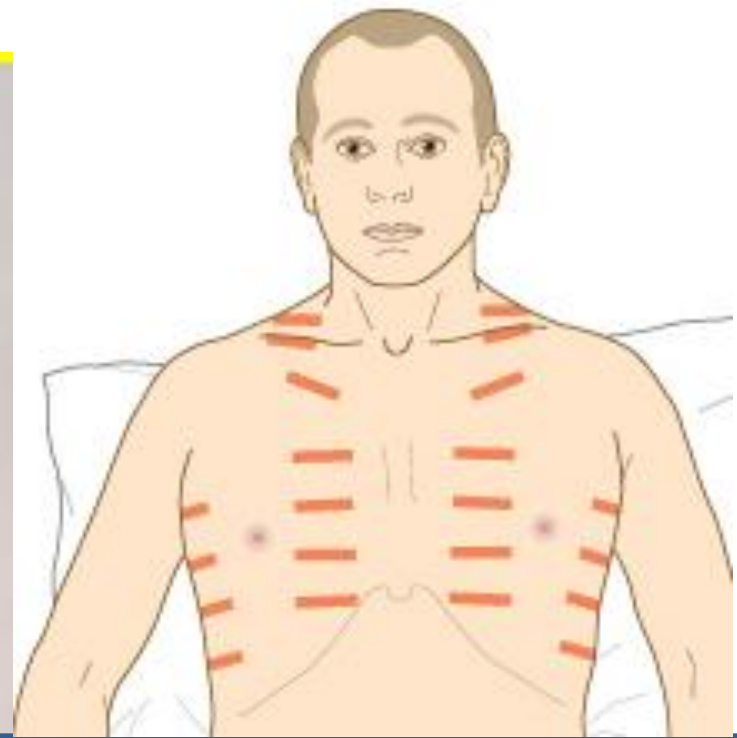
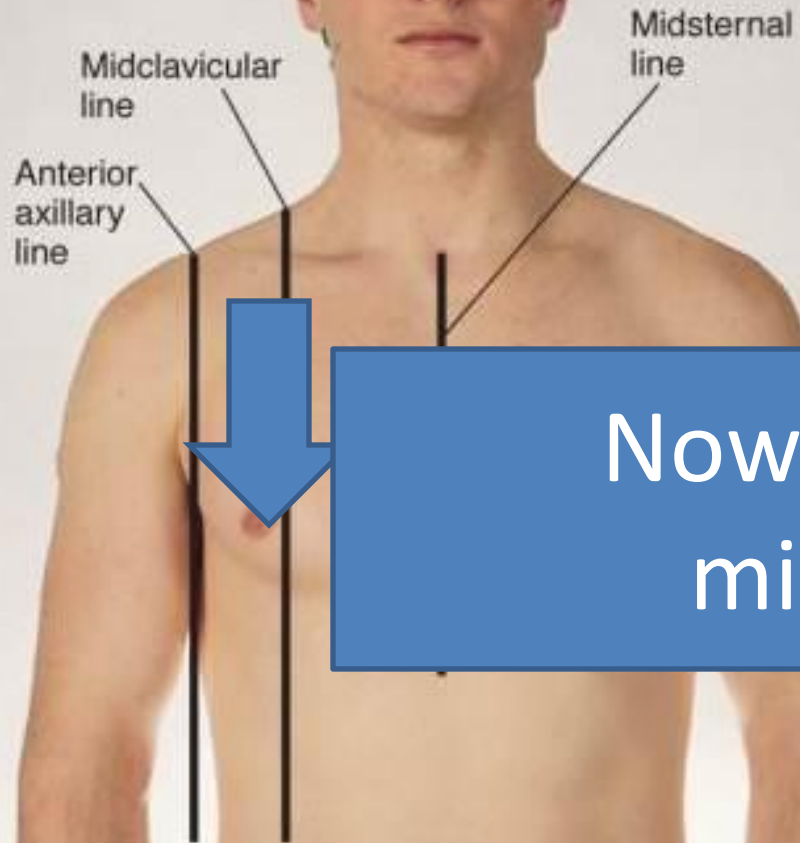
C

How will u do percussion anteriorly in midclavicular line :

- Patient chest should be exposed (without cloth)
- Both arms should be abducted to expose the lateral surface of chest
- Start percussion in above mention way in following sequence
 - First percussion over the right apex by placing your left middle finger over the supraclavicular fossa and do it over the left apex.
 - Now Percuss the left clavicle directly within its medial third and then do it in right
 - On percussion on rt 1st ICS –left 1st ICS then
 - on rt 2nd ICS –left 2nd ICS then
 - On left 3rd ICS –rt 3rd ICS thus do as Z pattern up to 6th ICS

Always keep the finger over space not over the ri





Now percussion along
midclavicular line



Percussion over right apex

1

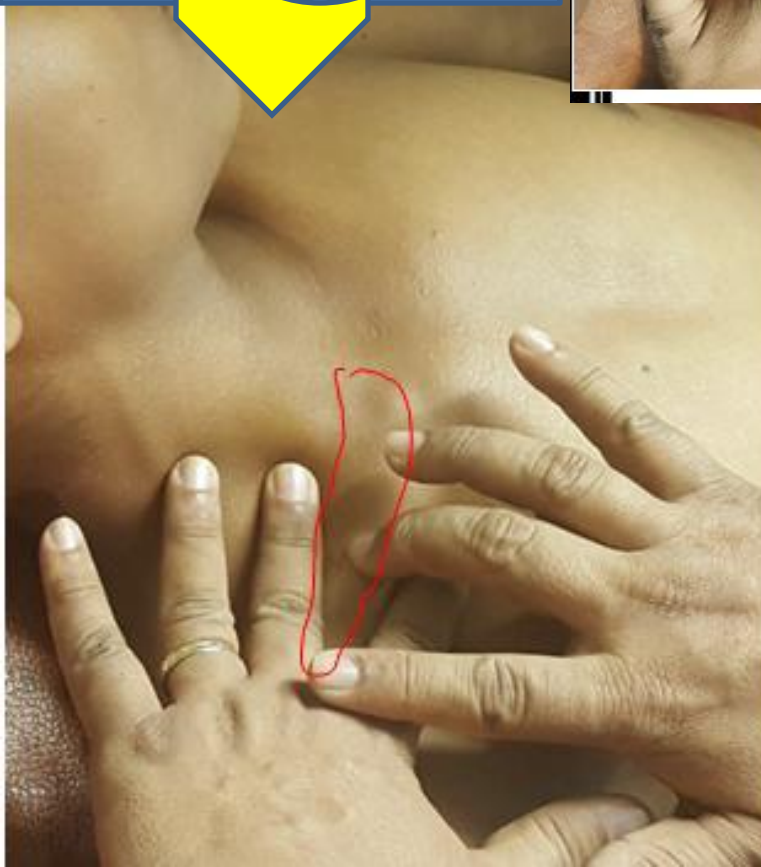


percussion over left apex

2

Percussion directly
over
Right clavicle

4



clavicle placed
in between index
& middle finger

Percussion directly
over
left clavicle

3

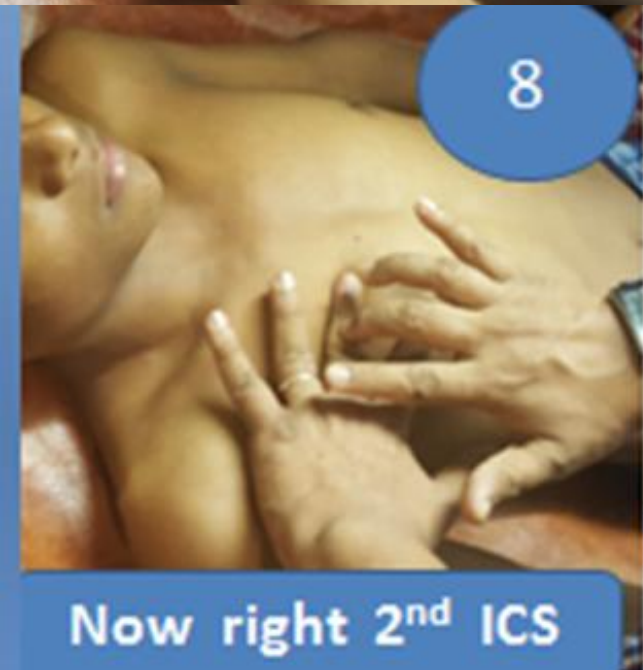




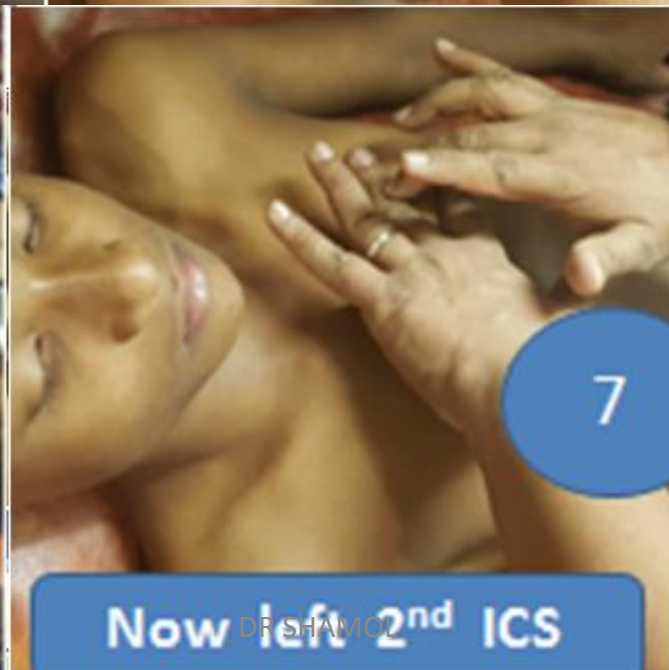
**first right intercostal space
just below the clavicle**



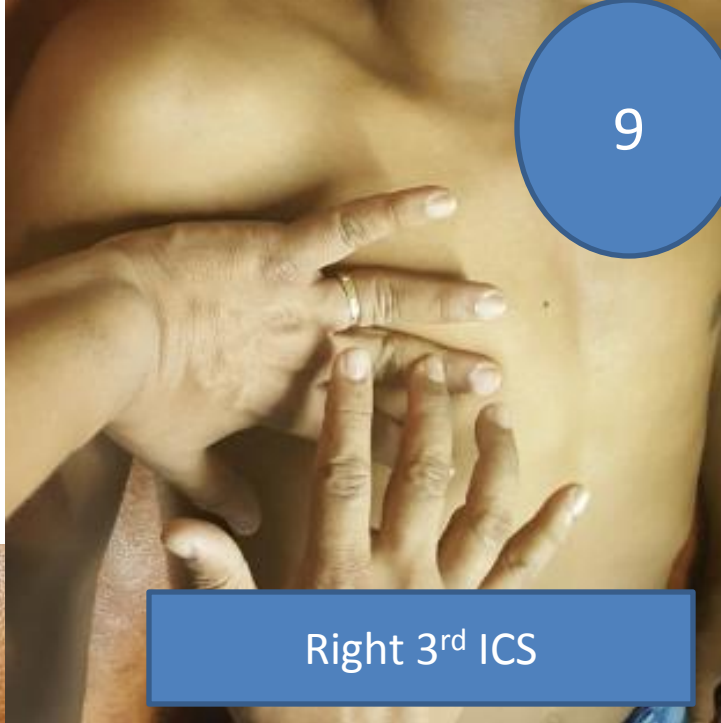
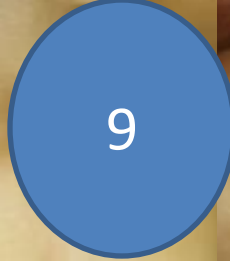
first left intercostal space



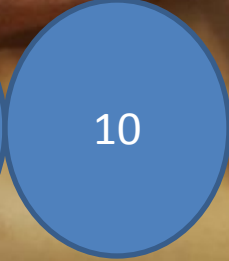
Now right 2nd ICS



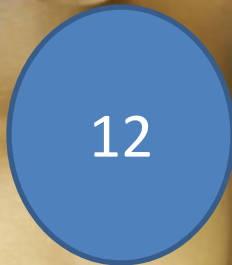
Now left 2nd ICS



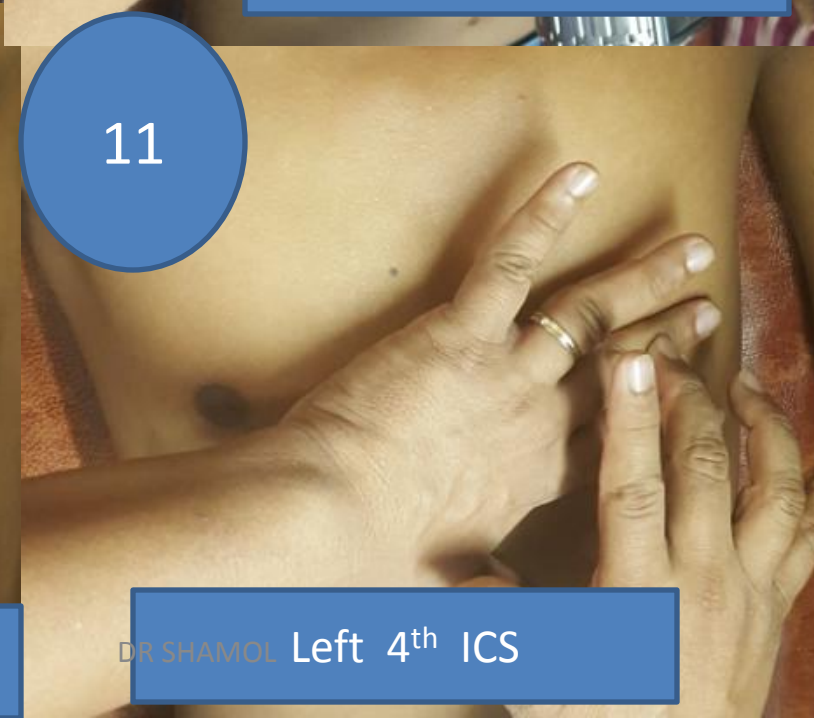
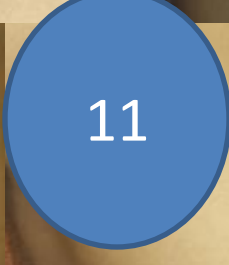
Right 3rd ICS



Left 3rd ICS



Right 4th ICS



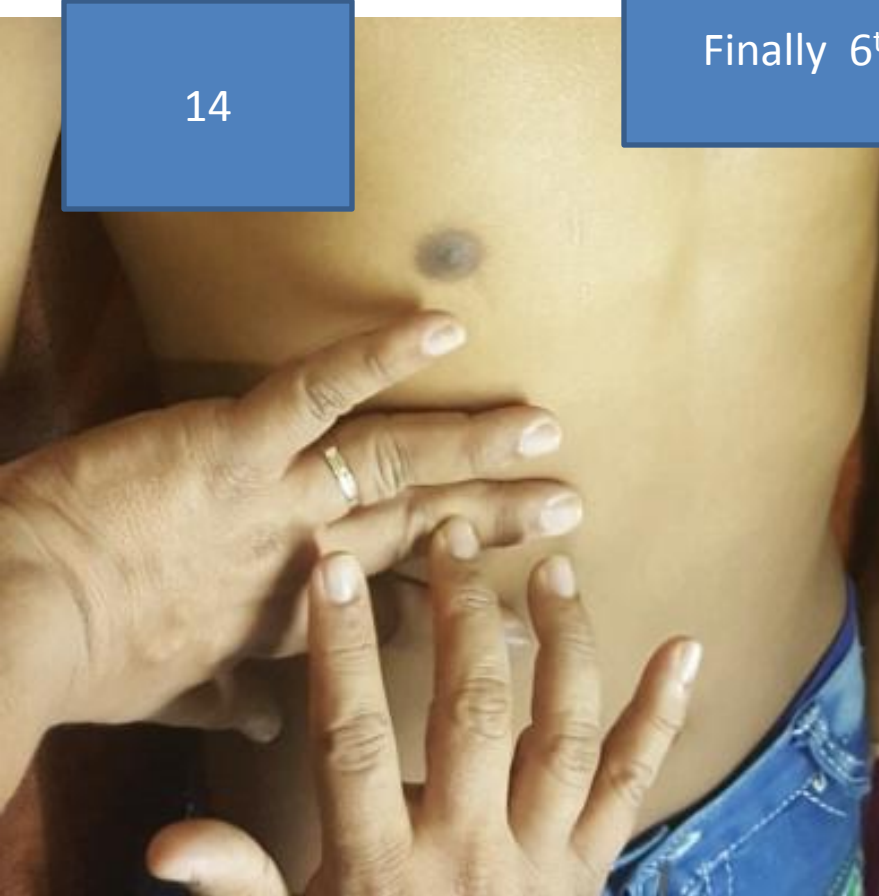
DR SHAMOL Left 4th ICS

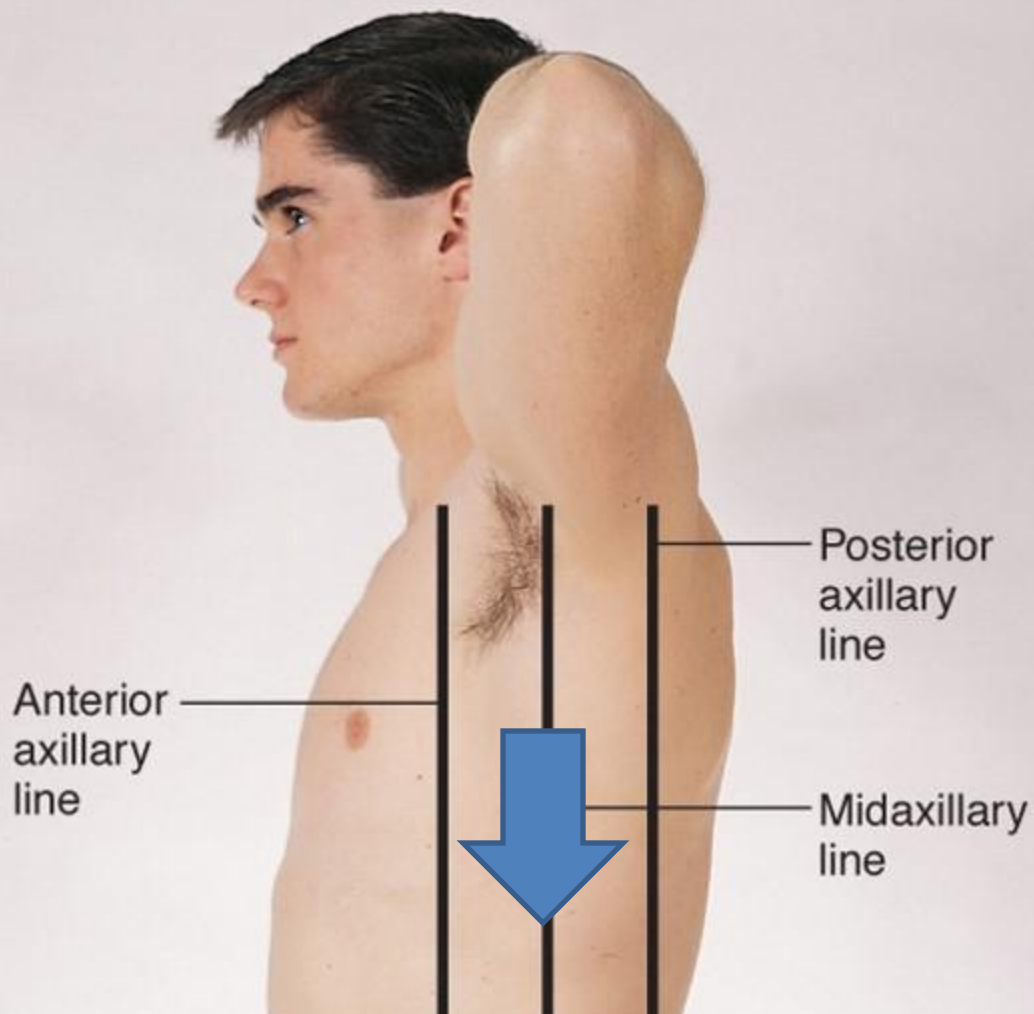
Like this percussion over 5th intercostals space

14

Finally 6th inter costal space

13



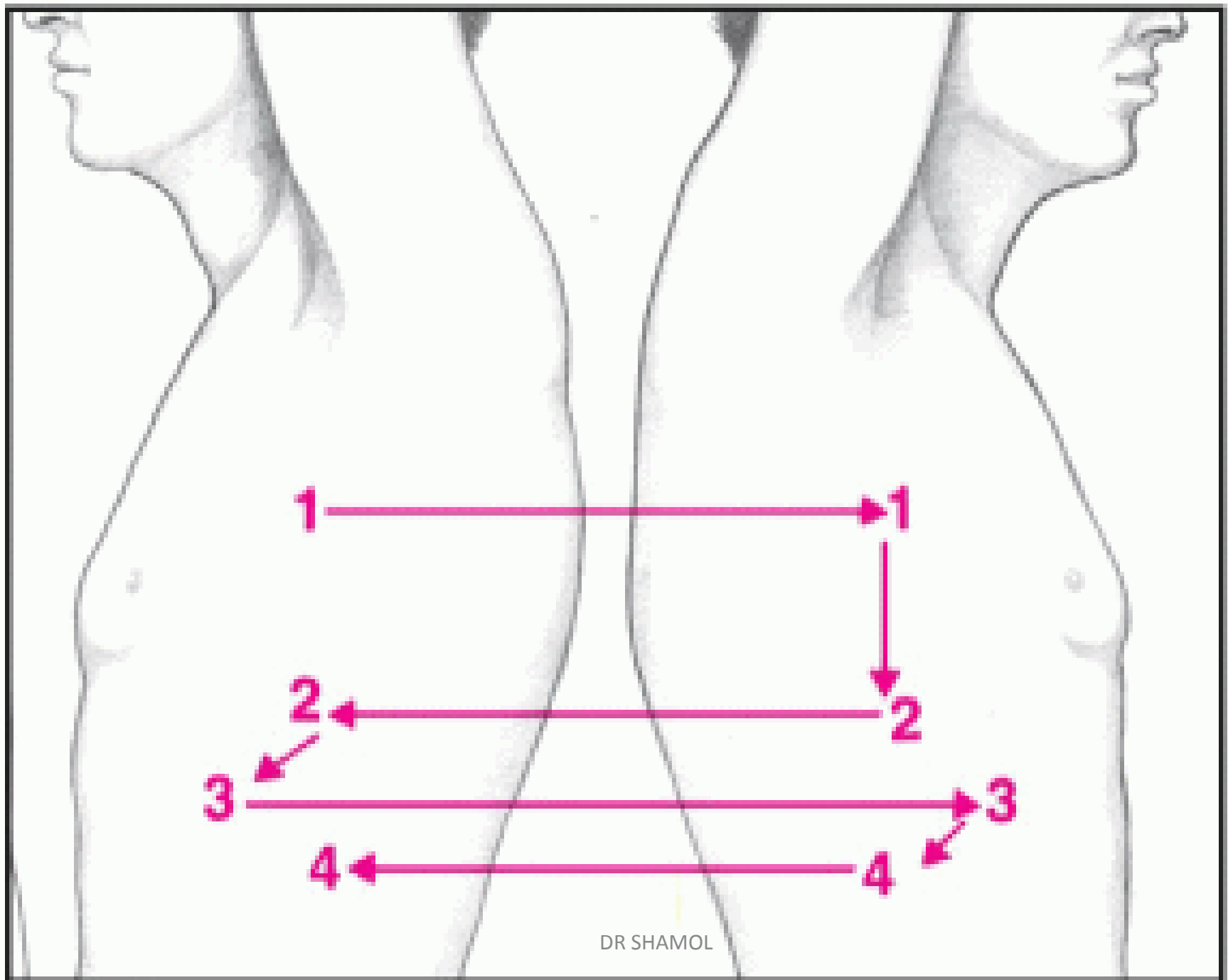


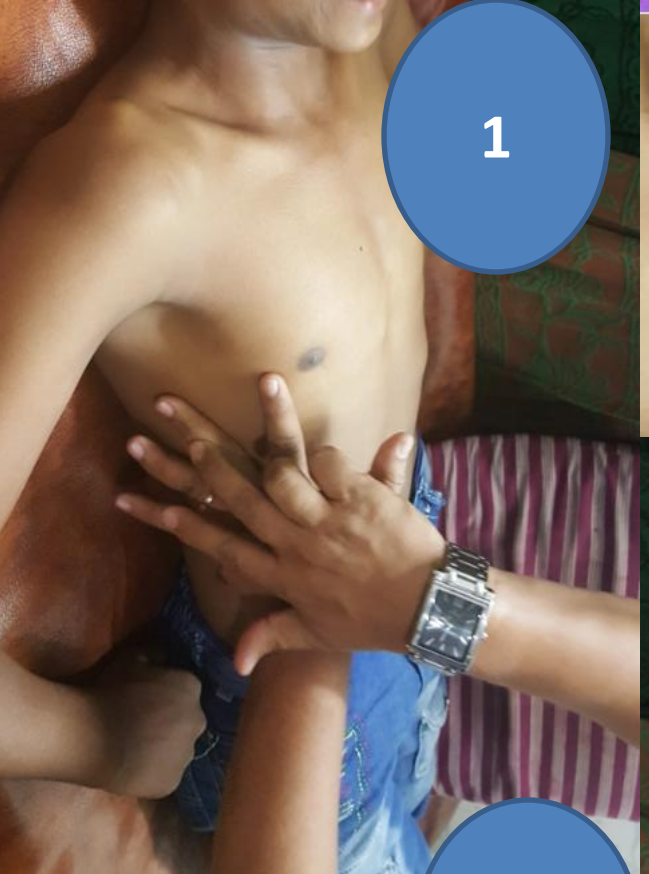
Now percussion along
midclavicular line

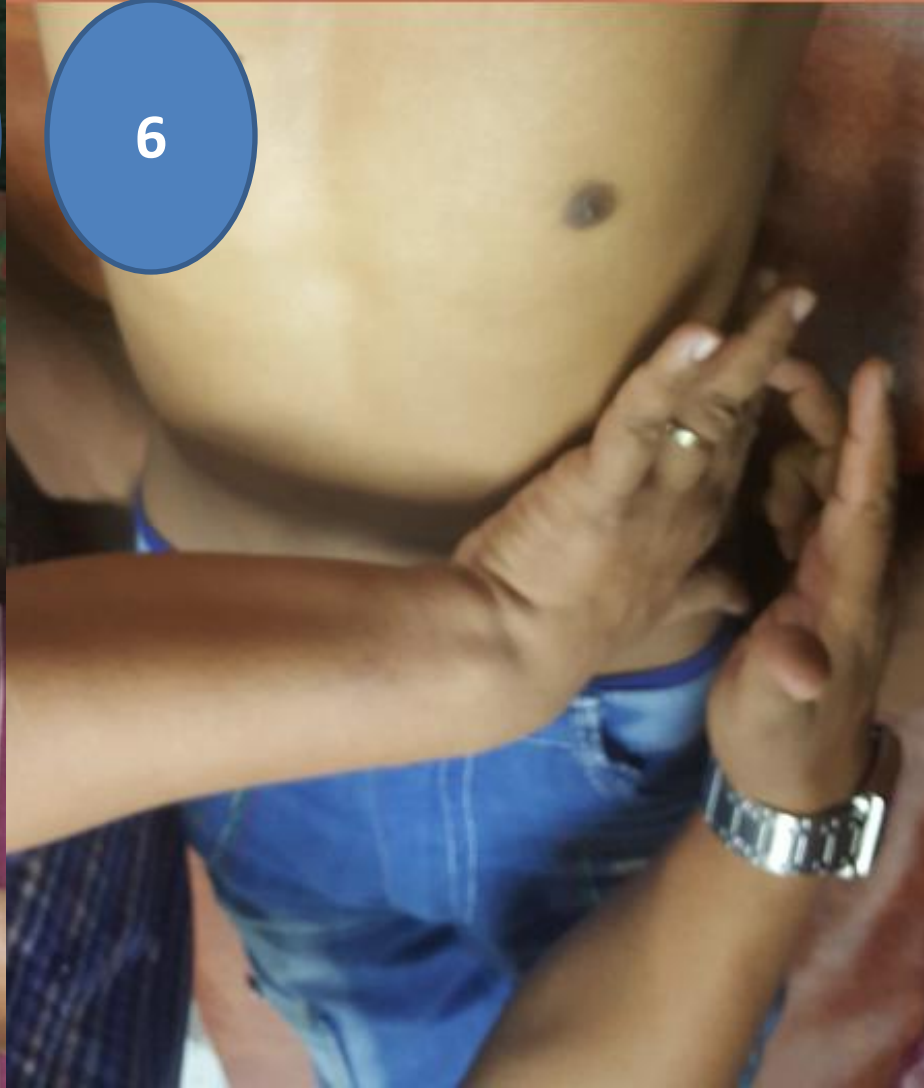
DR SHAMOL

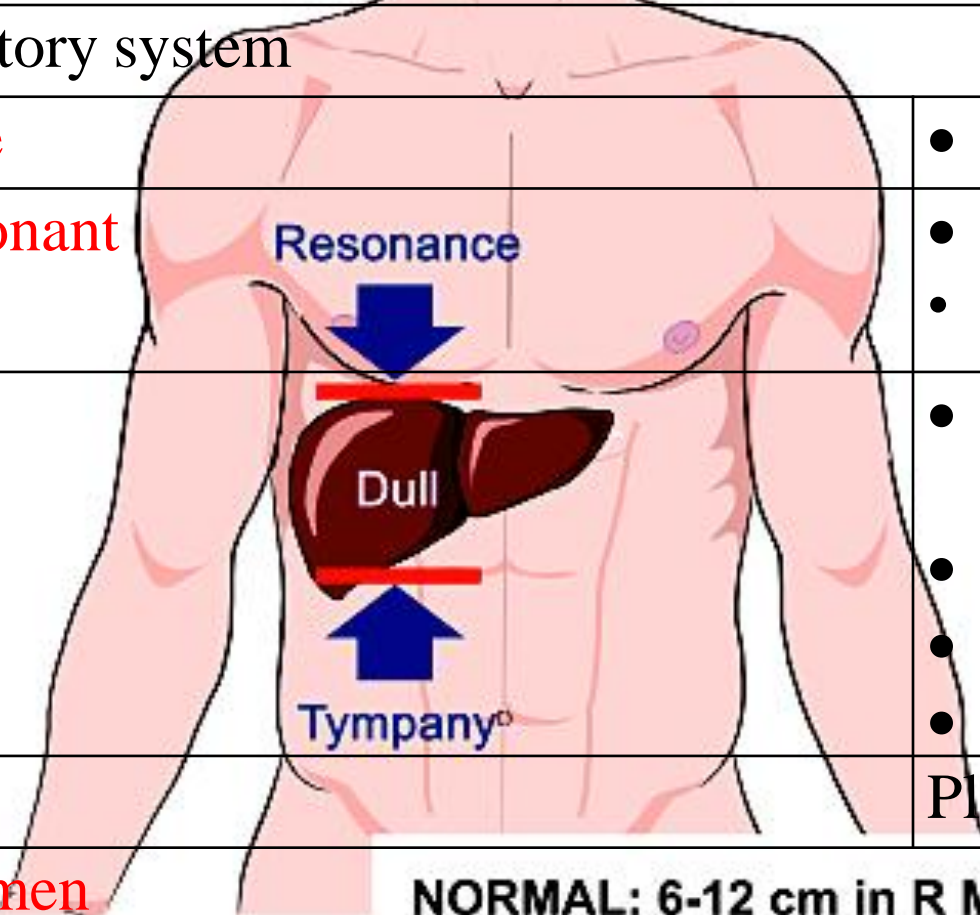
Now percussion over lateral chest along the mid axillary line

- **Do the same thing in following ways**
 - Compare right and left alternately such as
 - Rt 2nd ICS—Left 2nd ICS, left 3rd ICS—Rt 3rd ICS on ward in Z pattern up to 8th ICS
 - Give special attention that your finger main on intercostals not over the rib
 - For this reasons place the finger obliquely so that it remain in inter costal space not over the rib from the very beginning

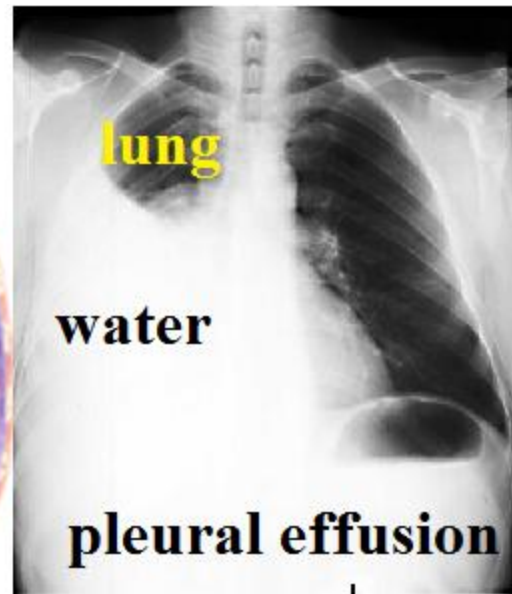
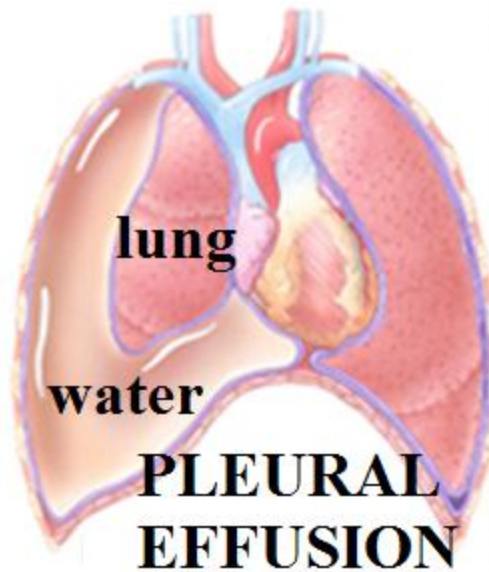
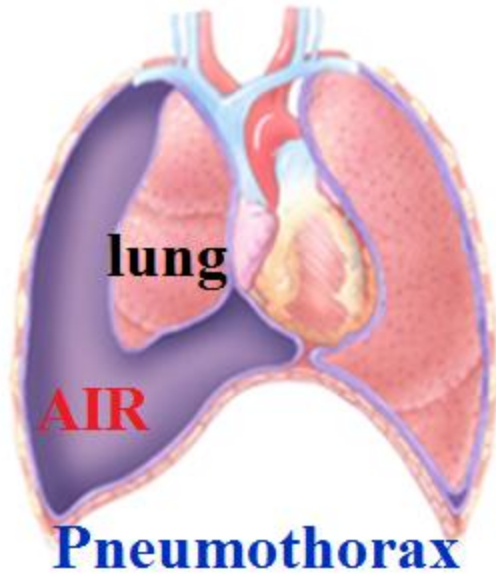




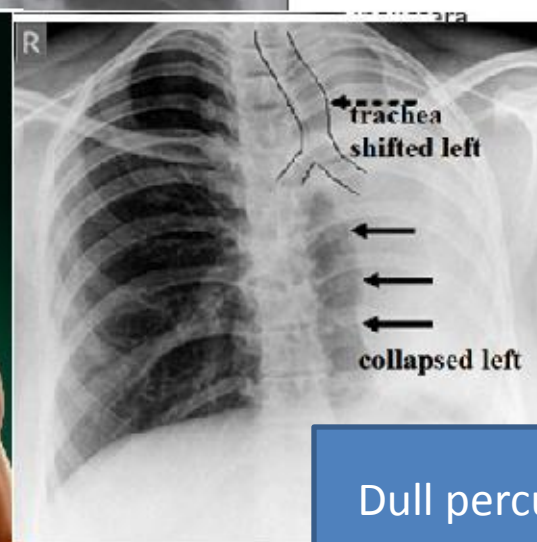
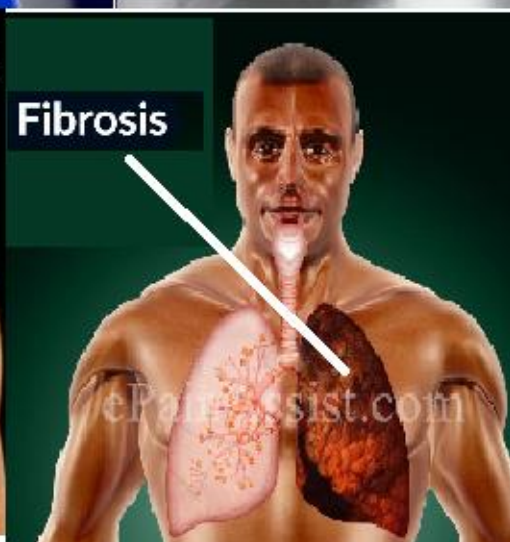
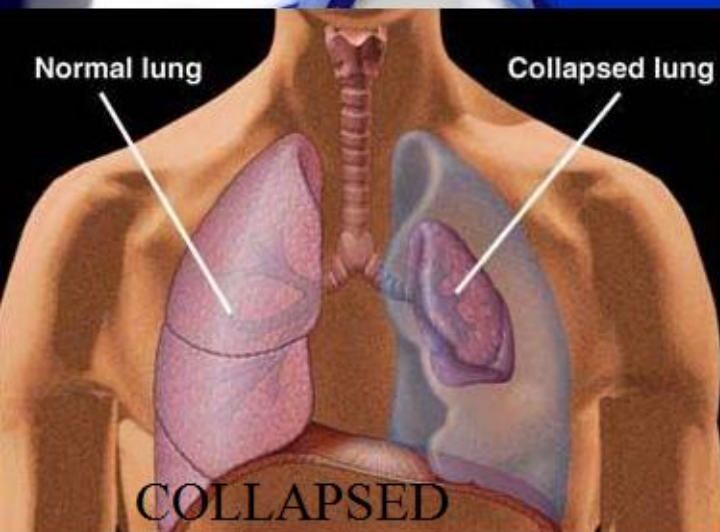
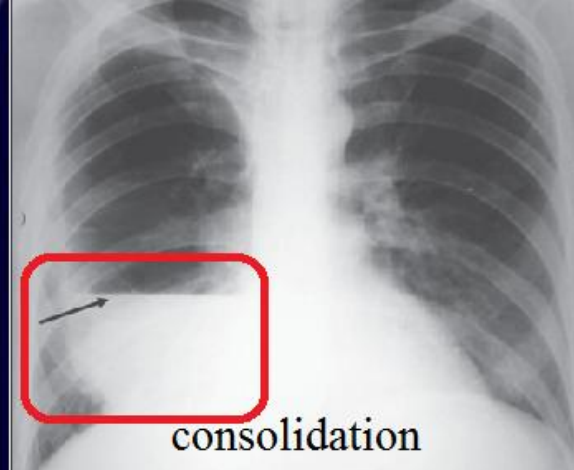
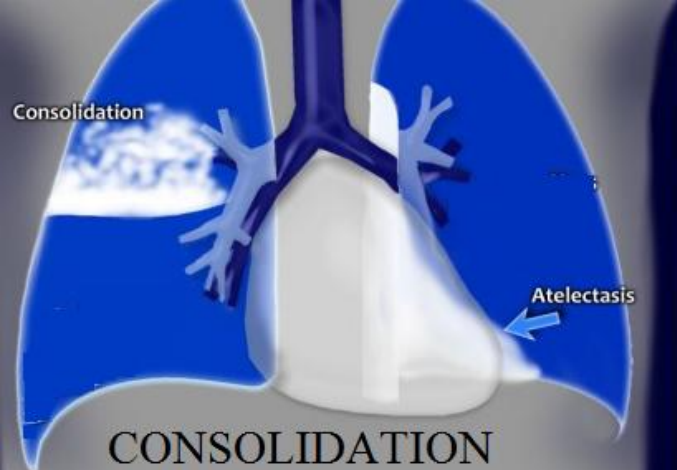


On respiratory system		
Resonance		<ul style="list-style-type: none">• Over normal chest
Hyper resonant		<ul style="list-style-type: none">• Pneumothorax• Emphysema
Dull		<ul style="list-style-type: none">• Woody dull---consolidation• Collapse• Fibrosis• Thicken pleura
Stony dull		Pleural effusion
over abdomen		
NORMAL: 6-12 cm in R MCL		
Tympanic		Over abdomen
Dulll		on liver and spleen

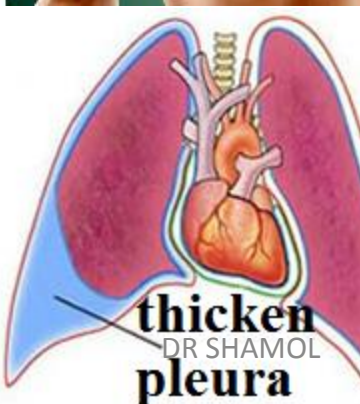
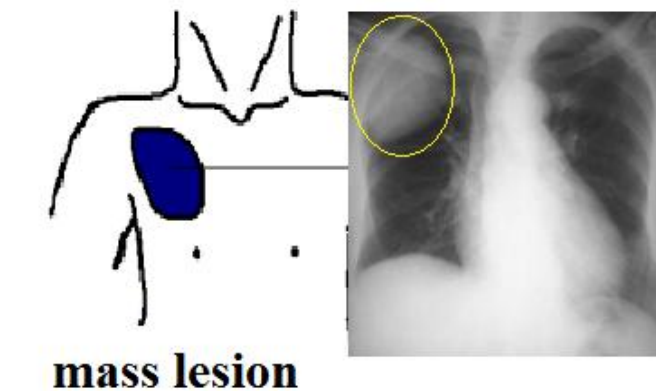
NORMAL: 6-12 cm in R MCL



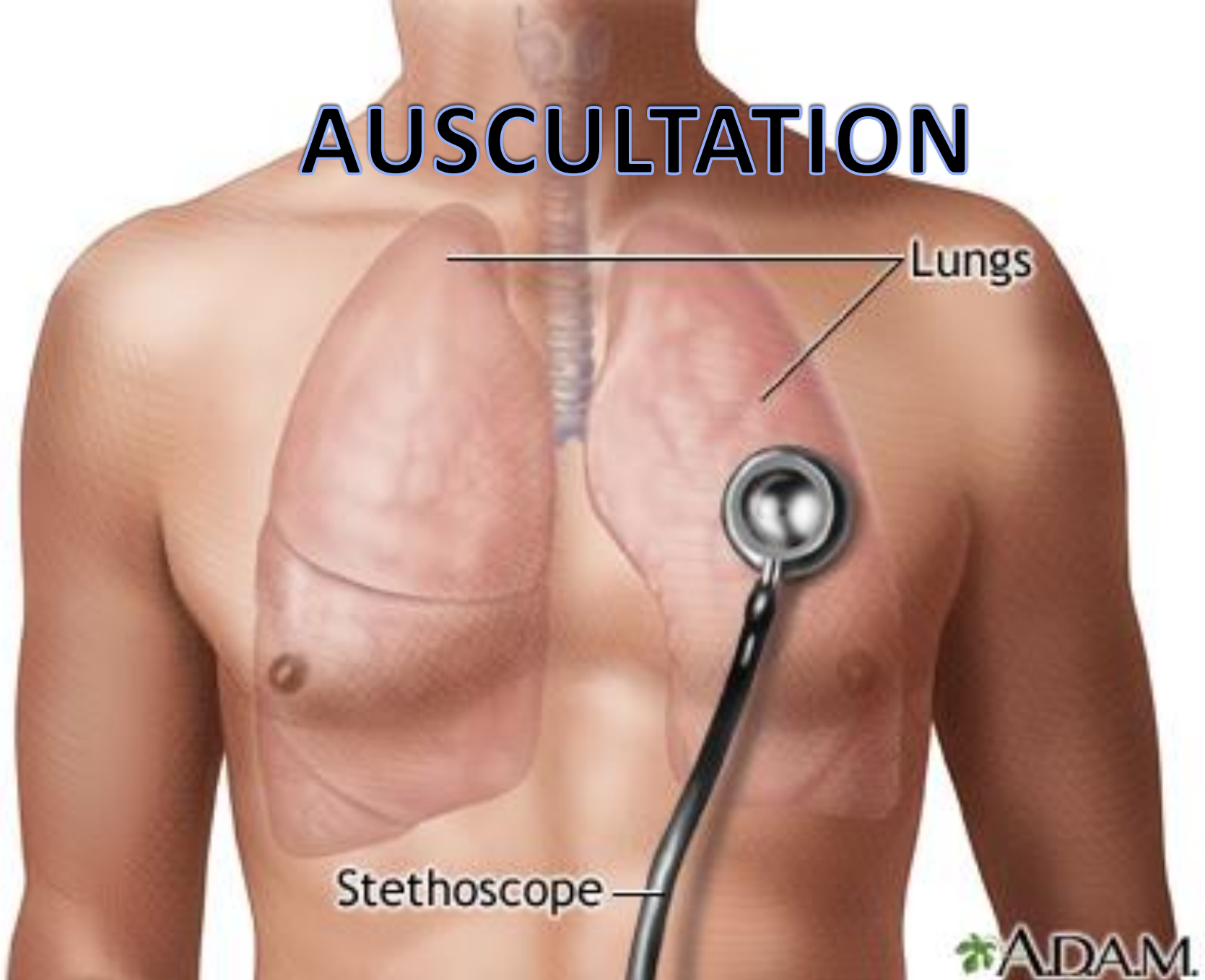
STONY DULL



Dull percussion

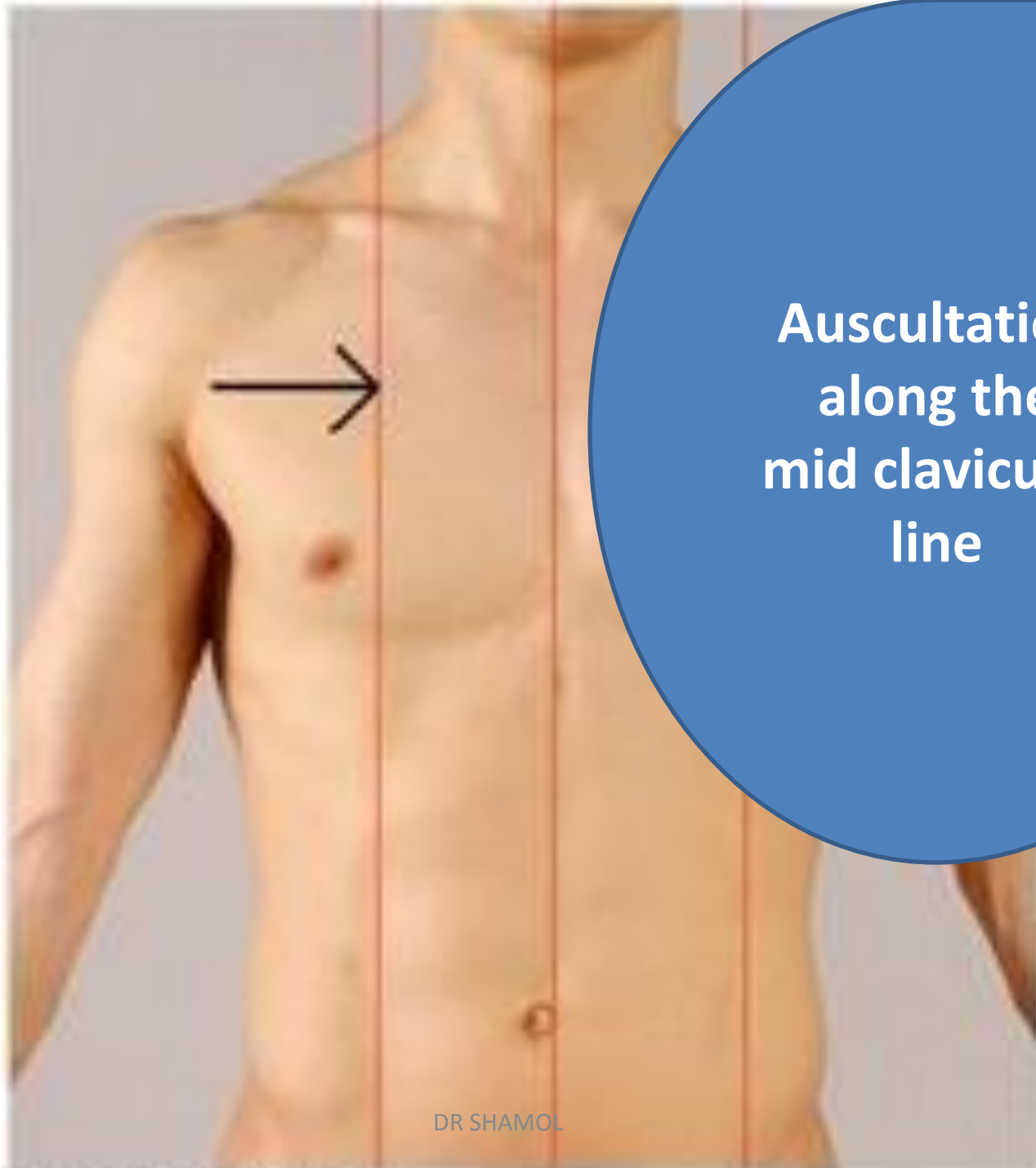


AUSCULTATION

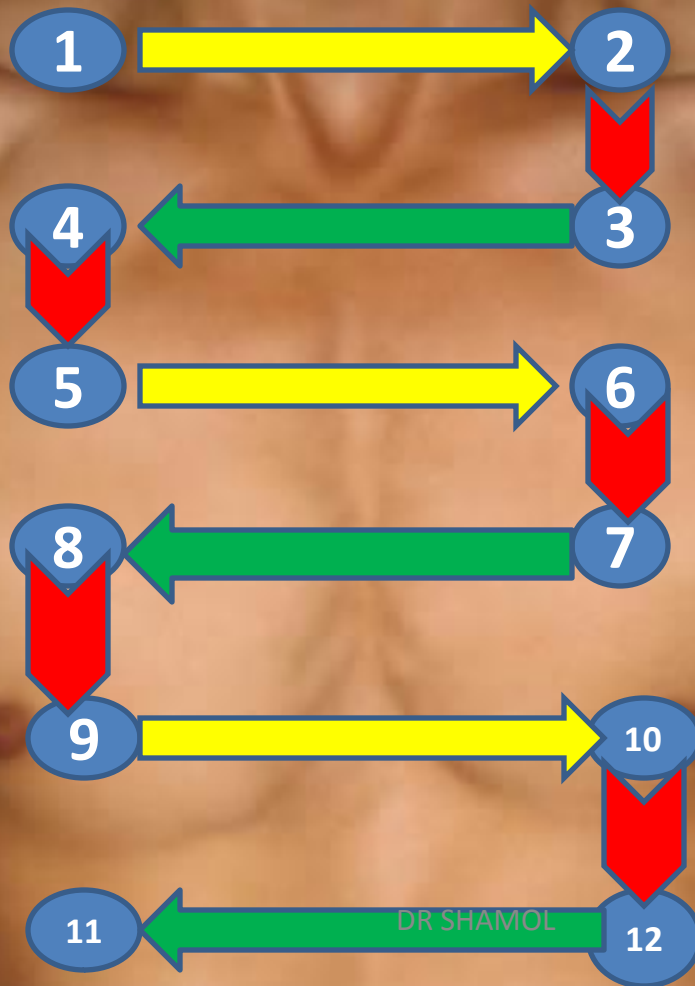
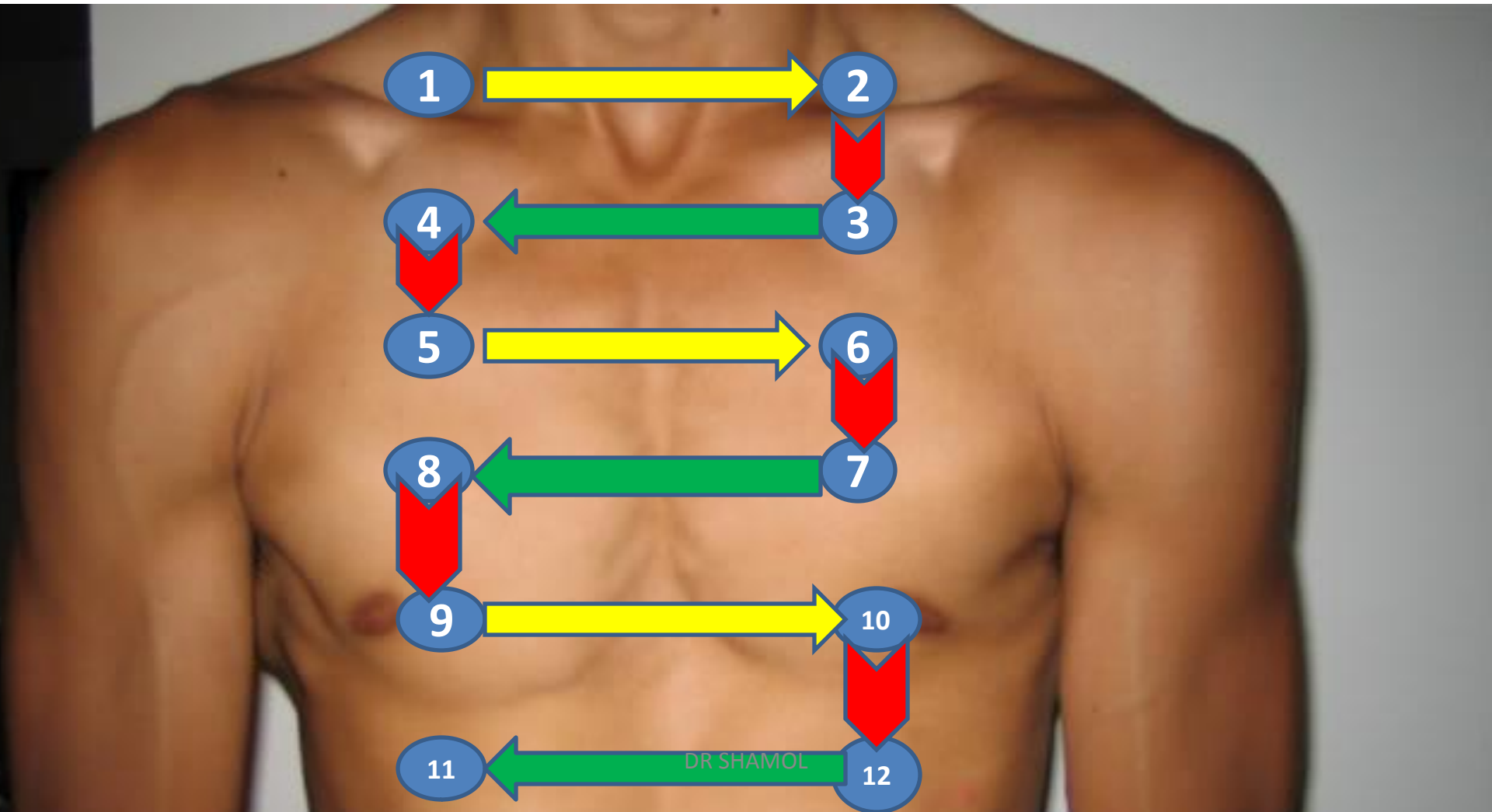




DR SHAMOL

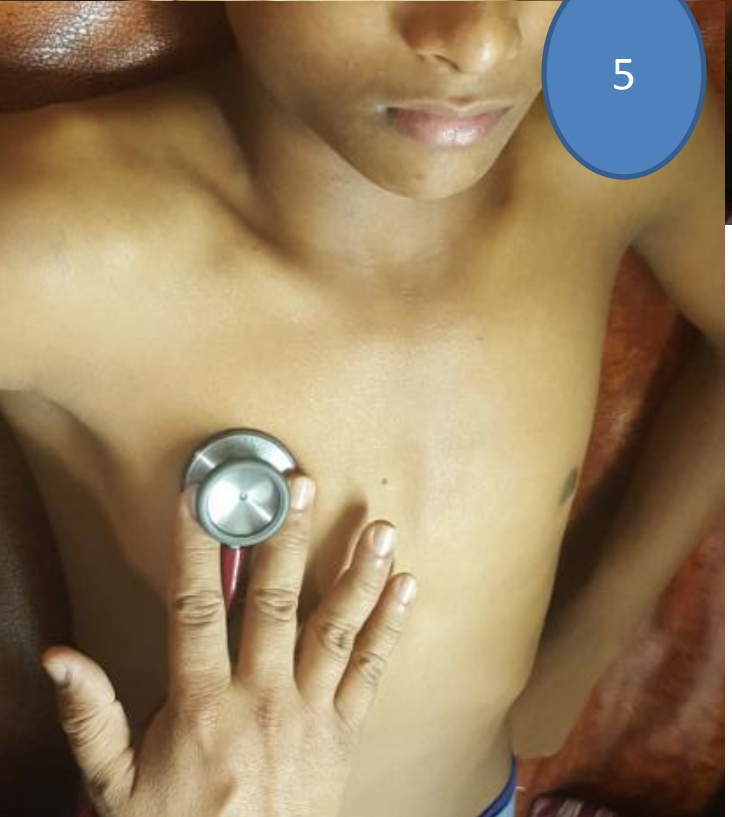


**Auscultation
along the
mid clavicular
line**





Auscultation of apex with the bell of stethoscope







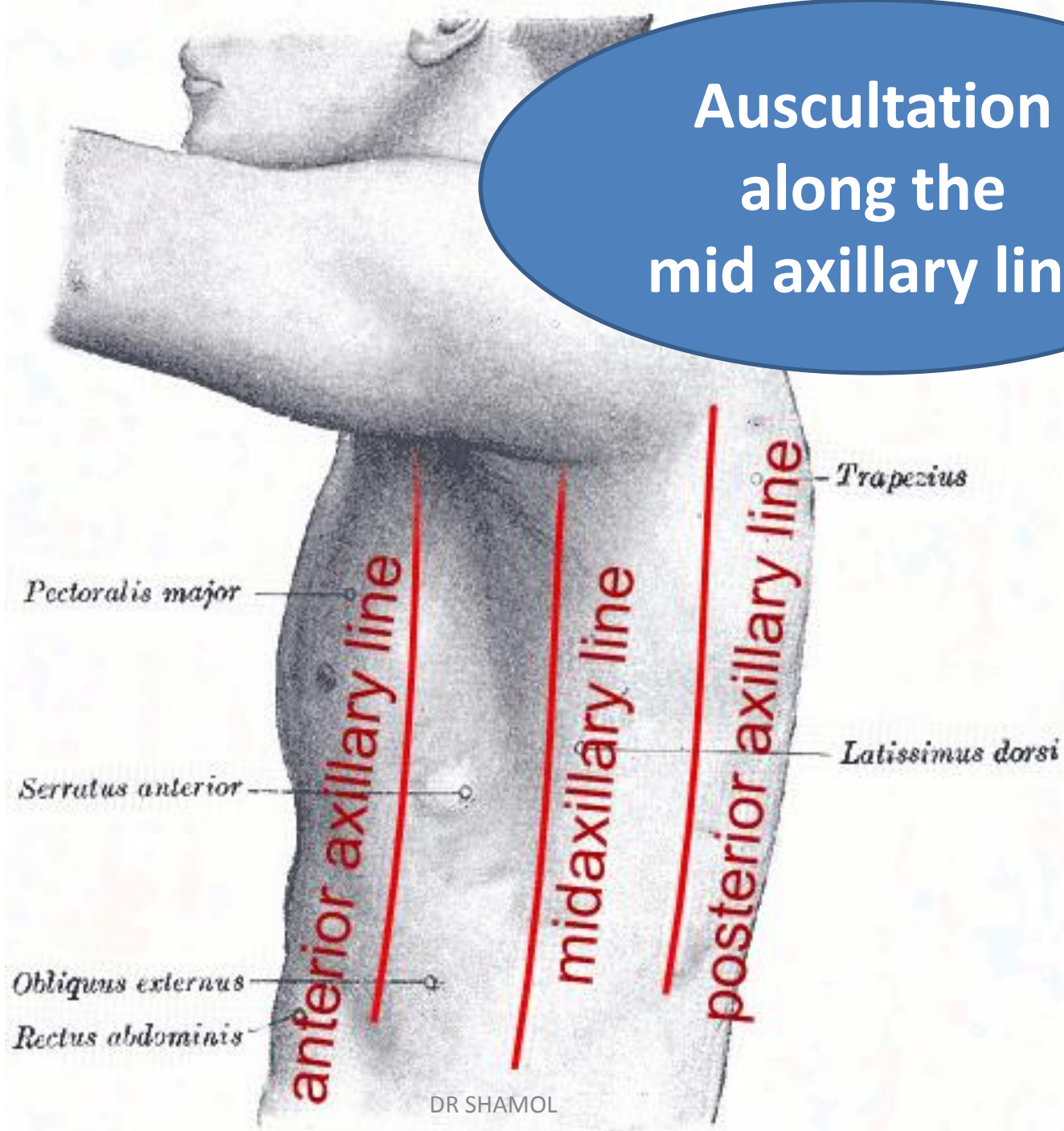
one --one /
nine –nine

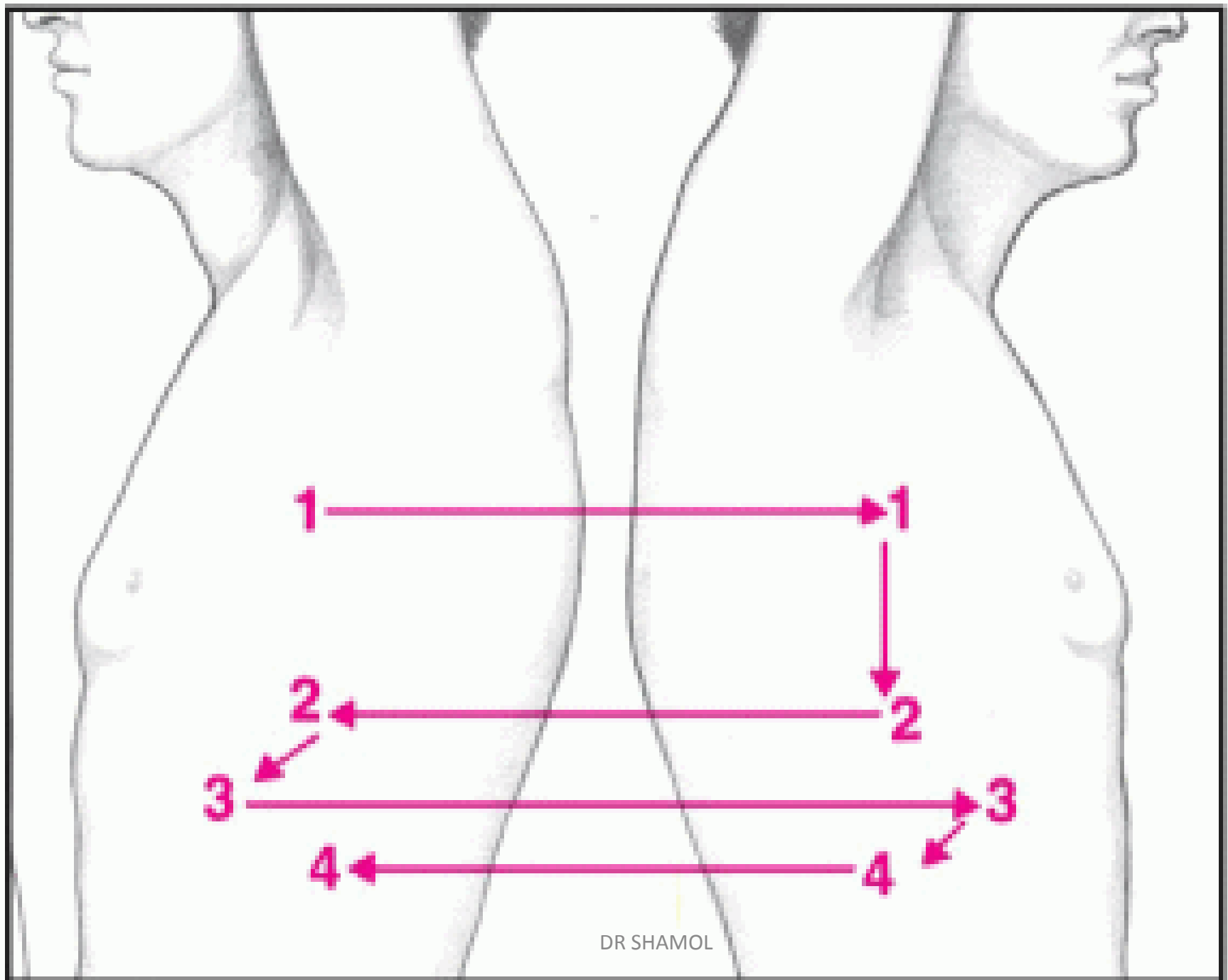


Vocal resonance : Auscultatory equivalent of vocal fremitus.

All the procedures are same as listening breath sound
Only we here ask the pt to say one one / nine –nine and
you have to listen with with stethoscope
We see it in three line and apex is listen when see the
anterior surface at midclavicular line

Auscultation along the mid axillary line





1



2



4



3



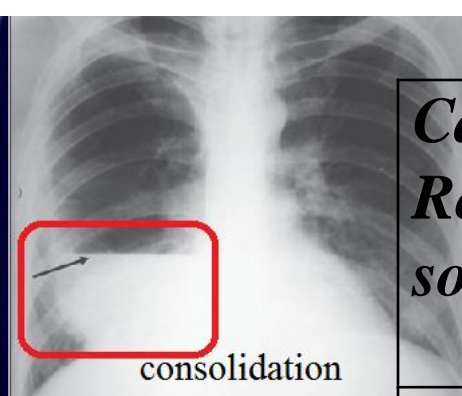
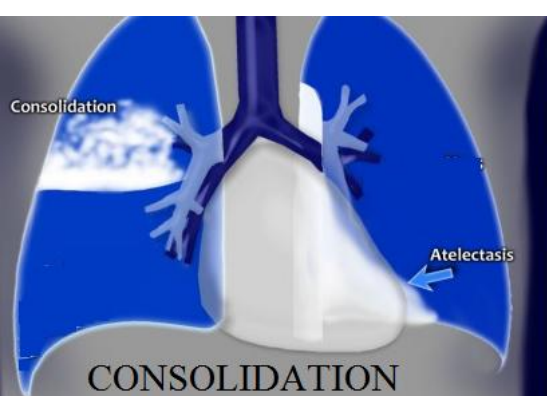
5



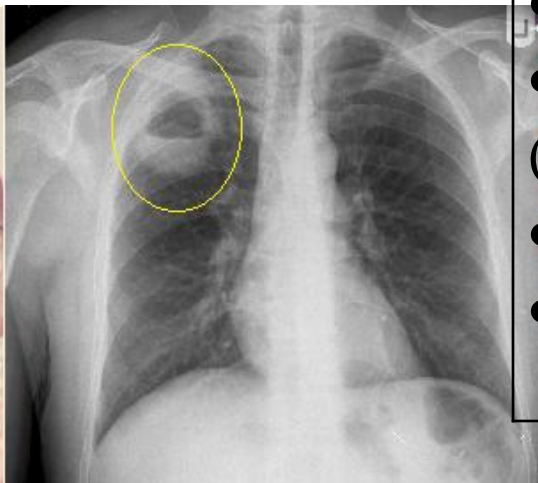
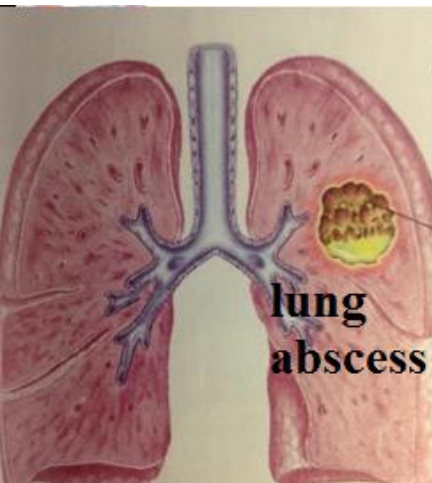
6



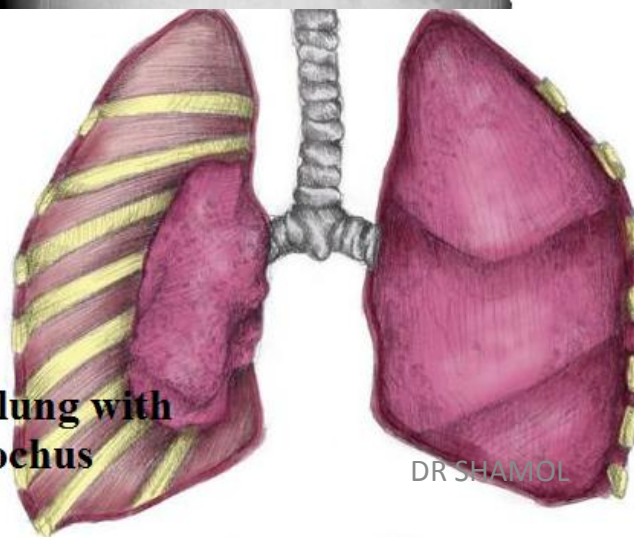
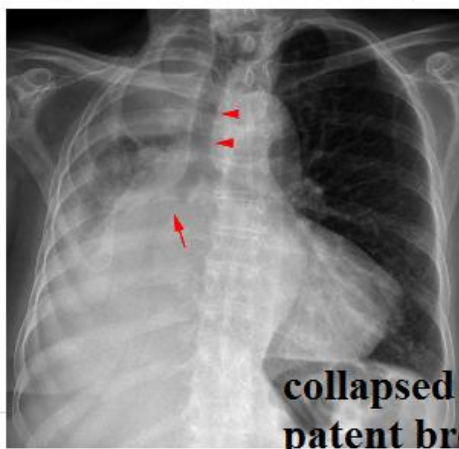




Cause increased Vocal fremitus & Resonance ,Bronchial breath sound (3CF)

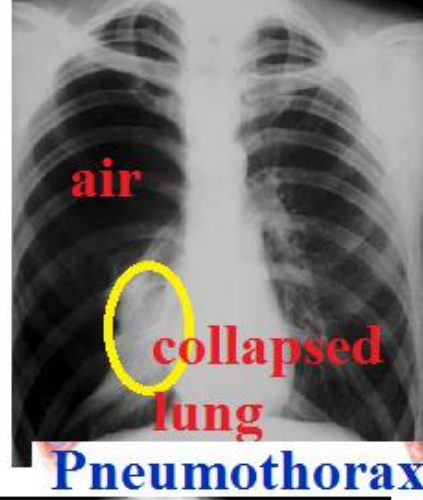


- Consolidation
- Collapse
(peripheral/ with patent bronchus)
- Cavitations
- Fibrosis



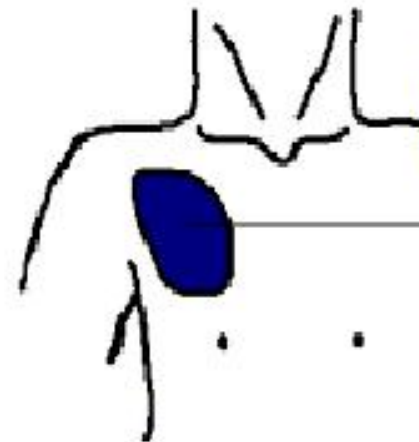
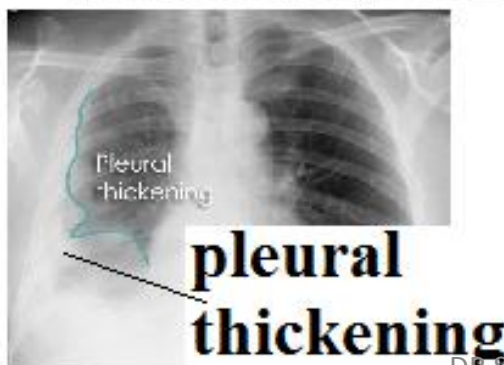
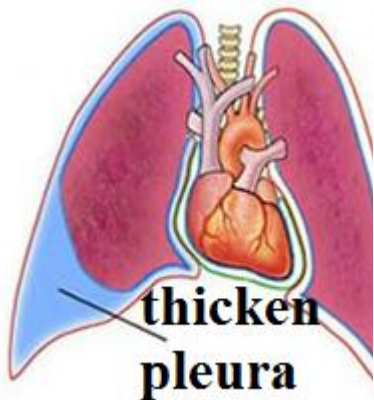
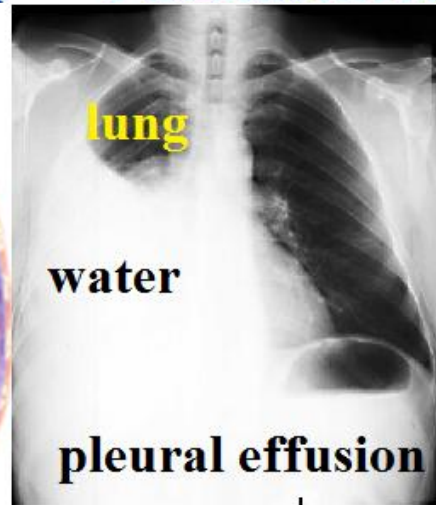
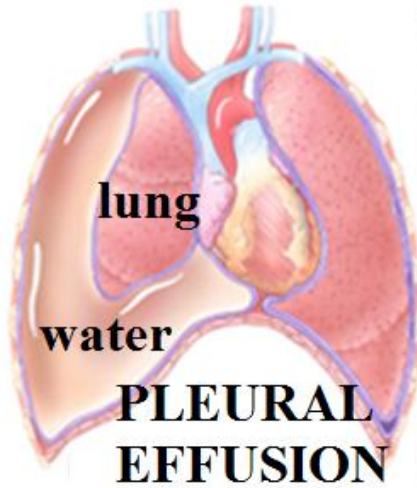
fibrosis of lung





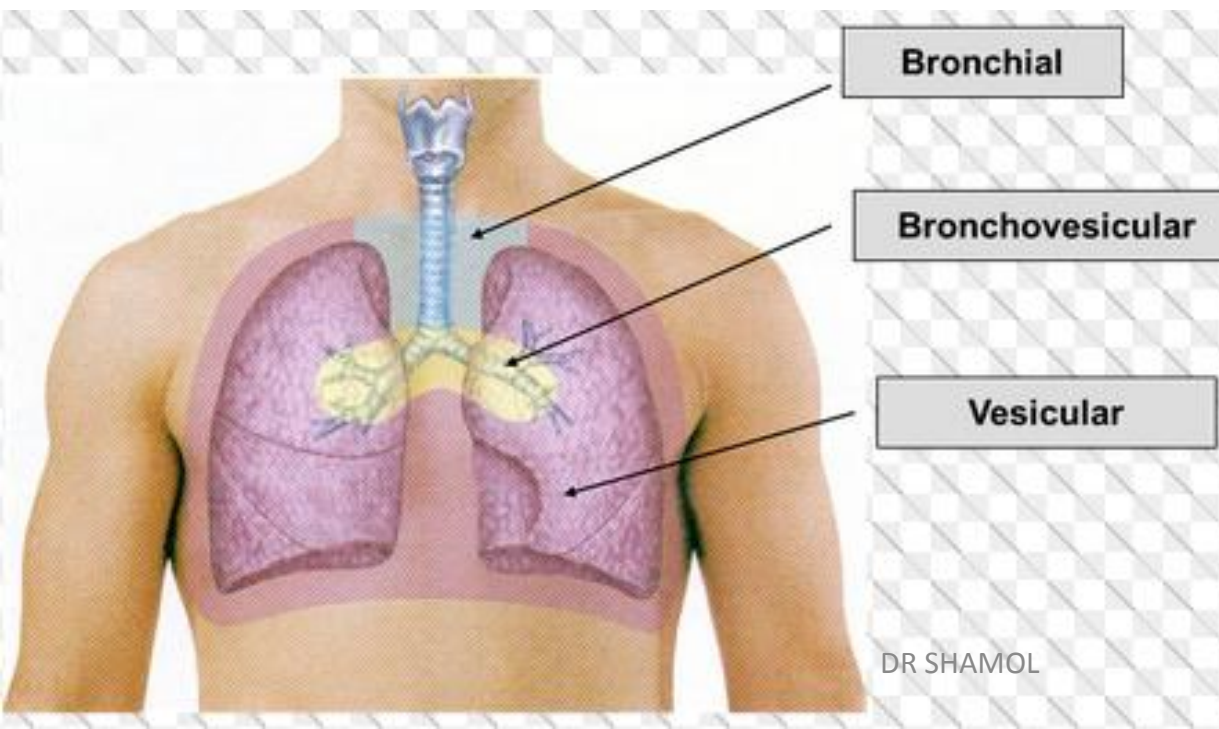
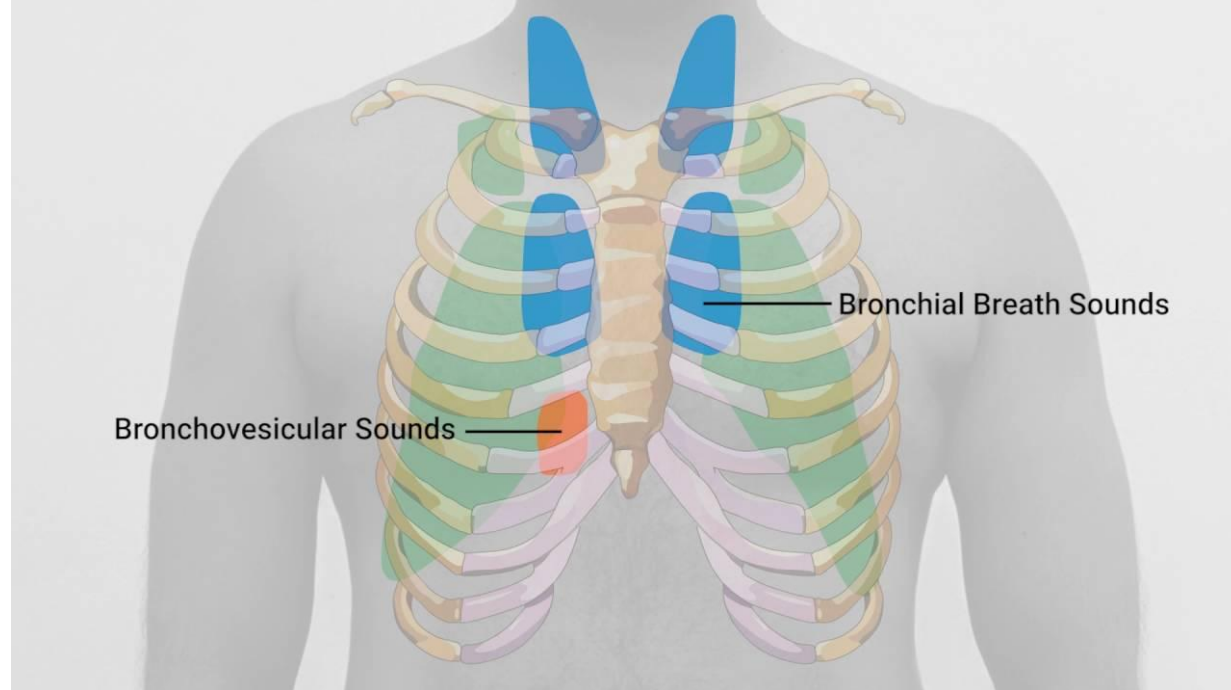
Cause decrease vocal fremitus and resonance , breath sound

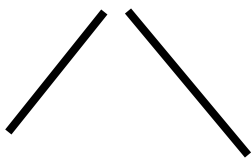
- Pleural effusion
- Pneumothorax
- Mass lesion
- Thicken pleura
- Central collapse (collapsed with out patent bronchus)

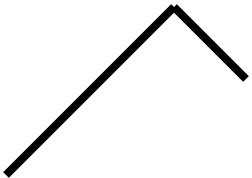
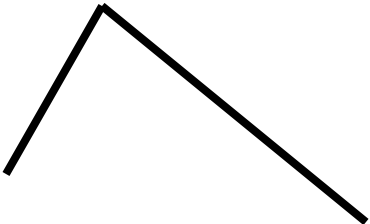


mass lesion





Type of breath sound ?
Three type of breath sound found in <ul style="list-style-type: none"> • Bronchial • Vesicular • Vesicular breath sound with prolong aspiration
What is normal breath sound ?
It is vesicular breath sound
What r the cause bronchial breath sound ?
C-CCF Consolidation Collapse (peripheral/ with patent bronchus) Cavitations Fibrosis
Where breath sound is normally bronchial ?
Breath sound is normally present trachea ,larynx , at mid line



Type of breath sound	Character	Cause
Bronchial 	<ul style="list-style-type: none"> • high-pitched with a hollow or blowing quality • Has two phase ,expiratory is more than > inspiratory phase • there are gap between inspiratory and expiratory • <u>two type</u> • high pitched – <ul style="list-style-type: none"> ○ consolidation ○ collapse with patent bronchus • low pitch <ul style="list-style-type: none"> ○ cavitations 	<p>3 CF</p> <ul style="list-style-type: none"> • •Consolidation • •Collapse (peripheral/ with patent bronchus) • •Cavitations • •Fibrosis <p>Normally found in</p> <ul style="list-style-type: none"> • Trachea • Larynx • Midline

		Cause of decreased sound
<p>Vesicular breath sound</p> 	<p>Normal breath sound</p> <p>Inspiration is louder & longer</p> <p>Expiration is shorter</p> <p>No gap between inspiration and expiration</p>	<ul style="list-style-type: none"> • Pleura effusion • Thicken pleura • Pneumothorax • Central collapse (with out patent bronchus) • Mass lesion
<p>Vesicular breath sound with prolong expiration</p> 	<p>Usually pathological</p> <p>Inspiration is shorter</p> <p>Expiration is longer</p> <p>There is no gap between inspiration & expiration</p>	<p>Cause</p> <ul style="list-style-type: none"> • COPD • Chronic bronchitis • Emphysema <p>Bronchial asthma</p>

Characteristics of Breath Sounds

	Duration of Sounds	Intensity of Expiratory Sound	Pitch of Expiratory Sound	Locations Where Heard Normally
Vesicular* 	Inspiratory sounds last longer than expiratory sounds.	Soft	Relatively low	Over most of both lungs
Bronchovesicular 	Inspiratory and expiratory sounds are about equal.	Intermediate	Intermediate	Often in the 1st and 2nd interspaces anteriorly and between the scapulae
Bronchial 	Expiratory sounds last longer than inspiratory ones.	Loud	Relatively high	Over the manubrium, (larger proximal airways)
Tracheal 	Inspiratory and expiratory sounds are about equal.	Very loud	Relatively high	Over the trachea in the neck

What are the added sound u listen during auscultation

Added sound are :

Wheeze (rhonchi):

Crackles (crepitations)

Pleural Rub

WHEEZE:/ RONCHI

It is the musical sound produced by passage of air through narrow air ways

Patho :

Mucosal edema

Spasm of bronchial musculature

Type :

On intensity

Low pitch : Indicate large bronchi obstruction

High pitch : Indicate small bronchi obstruction

On phase of respiration

Inspiratory wheeze

Expiratory wheeze

Cause of wheeze:

Bronchial asthma

COPD

CRACKLE

These are interrupted non musical the bubbling or crackling sounds occur due to passage of air through the fluid fill alveoli

Patho :

Due to fluid in alveoli (pulmonary edema)

Reopening of collapsed alveoli at end of inspiration (Fibrosing alveolitis)

Type :

On basis of intensity

Fine creps

Coarse creps

On phase of respiration

Inspiratory

Expiratory

Both

CAUSES OF CREPS

Fine

Pulmonary edema

Coarse creps

Bronchiectasis

Fibrosing alveolitis / ILD

Lung abscess

Resolving pneumonia

COPD (chronic bronchitis)

Cause of ends inspiratory creps ?

Pulmonary edema

Fibrosing alveolitis

DR SHAMOL

How will u differentiate between end-inspiratory creps of pulmonary edema and Fibrosing alveolitis?

Creps of pulmonary edema change with coughing

Creps of fibrosing alveolitis does not change with coughing and also have clubbing

Name the condition where creps disappear after coughing?

Pulmonary edema

Bronchiectasis

Lung abscess

Resolving pneumonia

PICTURE IF ild

PLEURAL RUB

It is creaking sound likened to the bending of new leather or the creak of a footstep in fresh snow...

Patho:

Caused by inflamed pleural surfaces rubbing against each other.

When best heard:

Heard at the height of inspiration

Disappear in breath hold

Pleural augment by the pressing the stethoscope

Causes:

it indicate pleurisy

Pneumonia,

How will u differentiate between pleural rub and pericardial rub?

1.1	Pleural rub	Pericardial rub
1. 2	Any where of the chest	Only over the pericardium (better left lower para sternal)
1. 3	Absent when respiration is ceased	No relation with respiration
1. 4	Occur due to pleurisy	Occur due to pericarditis

How will u differentiate between pleural rub and creps

	Pleural rub	Creps
1. 1	Pain full	Pain less
1. 2	Not change with cough	Change after coughing
1. 3	Augmented by pressing stethoscope	Not so
1. 4	It is creaking or rubbing sound	It is bubbling or cracking sound
1. 5	Due rubbing of inflamed pleura	Fluid in alveoli or reopening of collapsed alveoli

In viva 1st answer 1 and 2 then u may say next others

Vocal resonance:

It is the auscultatory equivalent of vocal fremitus.

Consolidated lung conducts sounds better than air-containing lung, so in consolidation the vocal resonance is increased and the sounds are louder and often clearer

It is three types

Bronchophony ---

It appears to be near the ear piece &

Ask the patient to say "ninety-nine" several times in a normal voice

The sounds you hear should be muffled and indistinct. Louder, clearer sounds are called bronchophony.

Cause –Consolidation

Egophony –

It is the nasal quality or goat like sound (aix-means goat and phony-means sound)

Found in --consolidation & Upper level of pleural effusion

Caused -- It is due to enhanced transmission of high-frequency noise across abnormal lung with lower frequencies filtered out.

Whispered Pectoriloquy--

Place stethoscope over chest and Ask the patient whispers a phrase (e.g. 'one-one')

You should hear only faint sounds or nothing at all. If you hear the sounds clearly this is referred to as whispered pectoriloquy

Found in --**Consolidation**


wheezes	mechanism----- rapid airflow through obstructed airways caused by bronchospasm, mucosal edema	
	high-pitched, most often occur during exhalation •	
	Causes---- asthma, congestive heart failure, bronchitis	
stridor	Possible mechanism----- rapid air in flow through obstructed airway caused by inflammation	
	high-pitched; often occurs during inspiration	
	URTI	
crackles	Possible mechanism ---excess airway secretions moving with airflow (inspiratory and expiratory crackles	
	coarse and often clear with cough	
	bronchitis, respiratory infections	
A pleural rub	Possible mechanism ---is a creaking or grating type of sound that occurs when the pleural surfaces become inflamed and roughened edges rub together during breathing,	
Vocal resonance	It is a voice sound heard with the chest piece of the stethoscope	
	Bronchophony	voice sounds appear to be heard near the earpiece of stethoscope and words are unclear
		Example----- consolidation, cavity communicating with a bronchus, above level of pleural effusion
	• Egophony	voice sounds has a nasal or bleating quality. On saying E it will be heard as A (E to A sign)
		consolidation, cavity, above the level of pleural effusion
	Whispering pectoriloquy	the patient is asked to whisper words at the end of expiration, and this whispered voice is transmitted without distortion so that the individual syllables are recognised clearly
		example-----pneumonic consolidation

EXAMINATION OF CHEST FROM BACK

Step 1: Introduced your self to the patient and take consent from the patient by telling that I m going to examination u for my purpose, it will not hurt u. I can proceed.

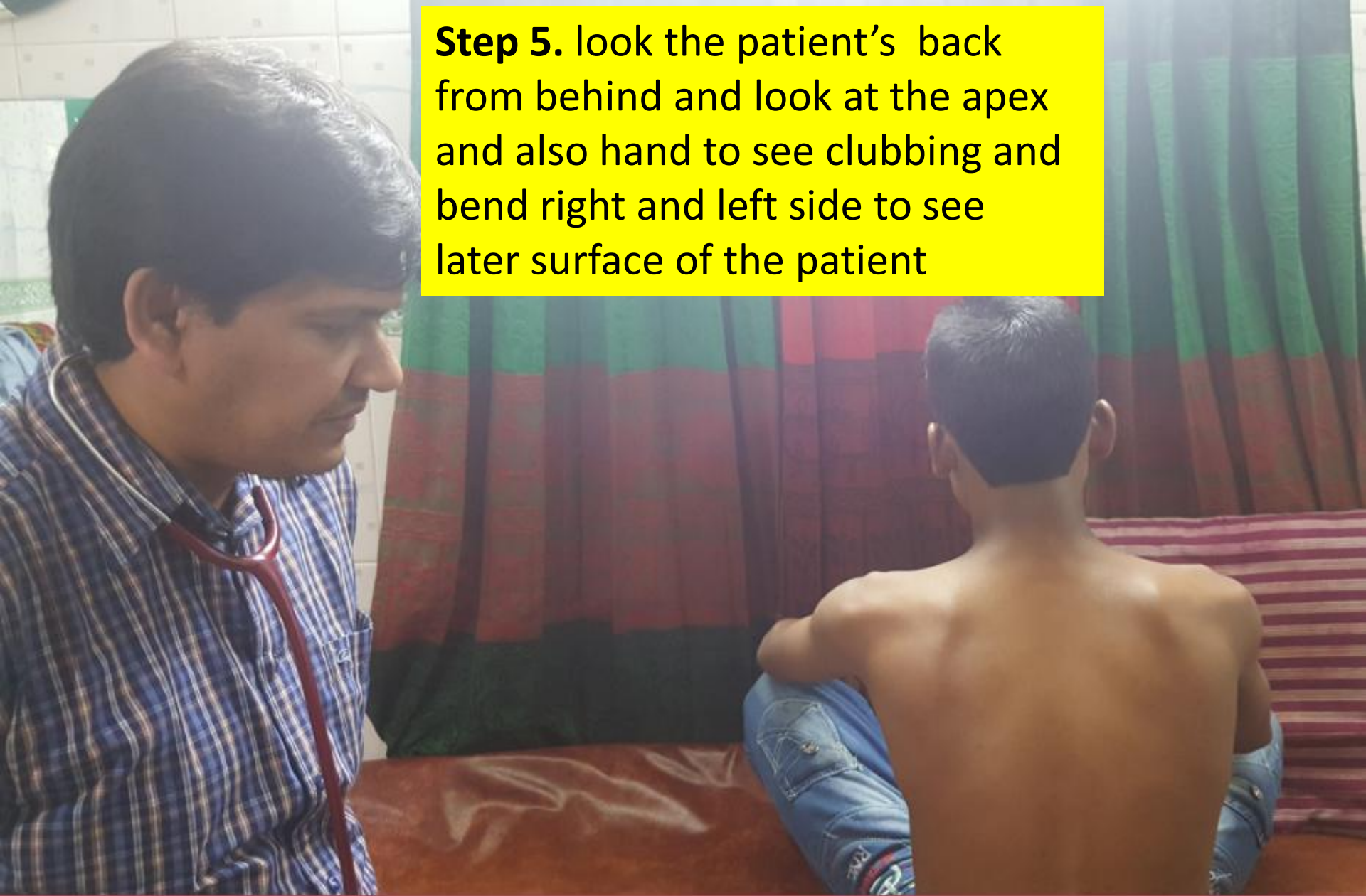
Step 2 : ask to patient to sit down
keeping the back toward you
Step 3 : Now expose the patient



A photograph of a person from the back, sitting down. Their hands are placed on their own shoulders, with fingers spread. The person has short, dark hair. They are wearing a blue denim shirt. The background consists of a red patterned curtain on the left and a green curtain on the right. A yellow text box is overlaid on the right side of the image.

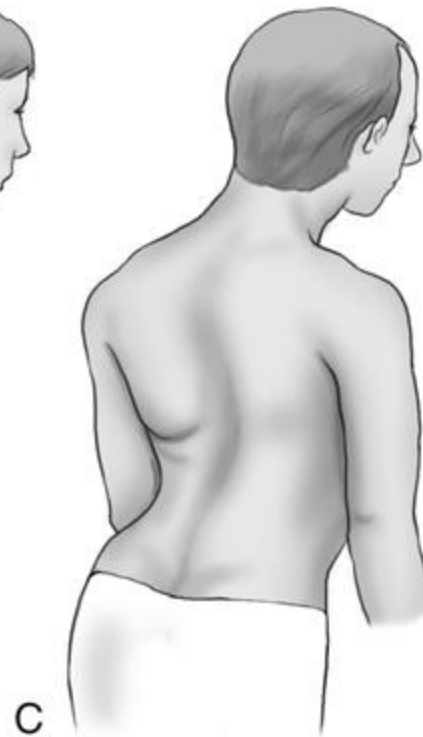
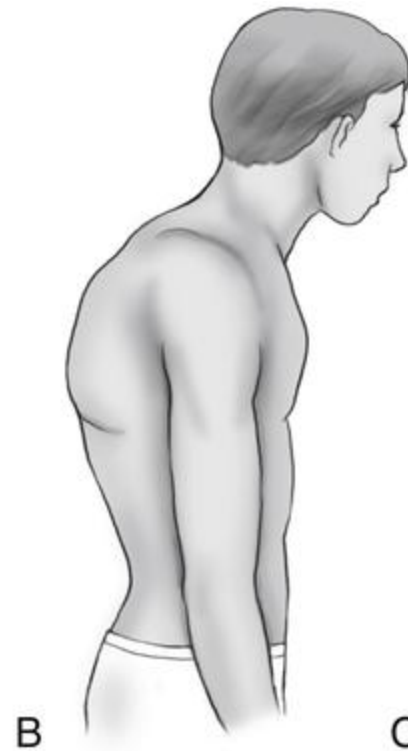
Step 4 : position of patient – patient should sit down and keep his right hand on left shoulder and keep left hand on right shoulder exposing the both apex

Step 5. look the patient's back from behind and look at the apex and also hand to see clubbing and bend right and left side to see later surface of the patient



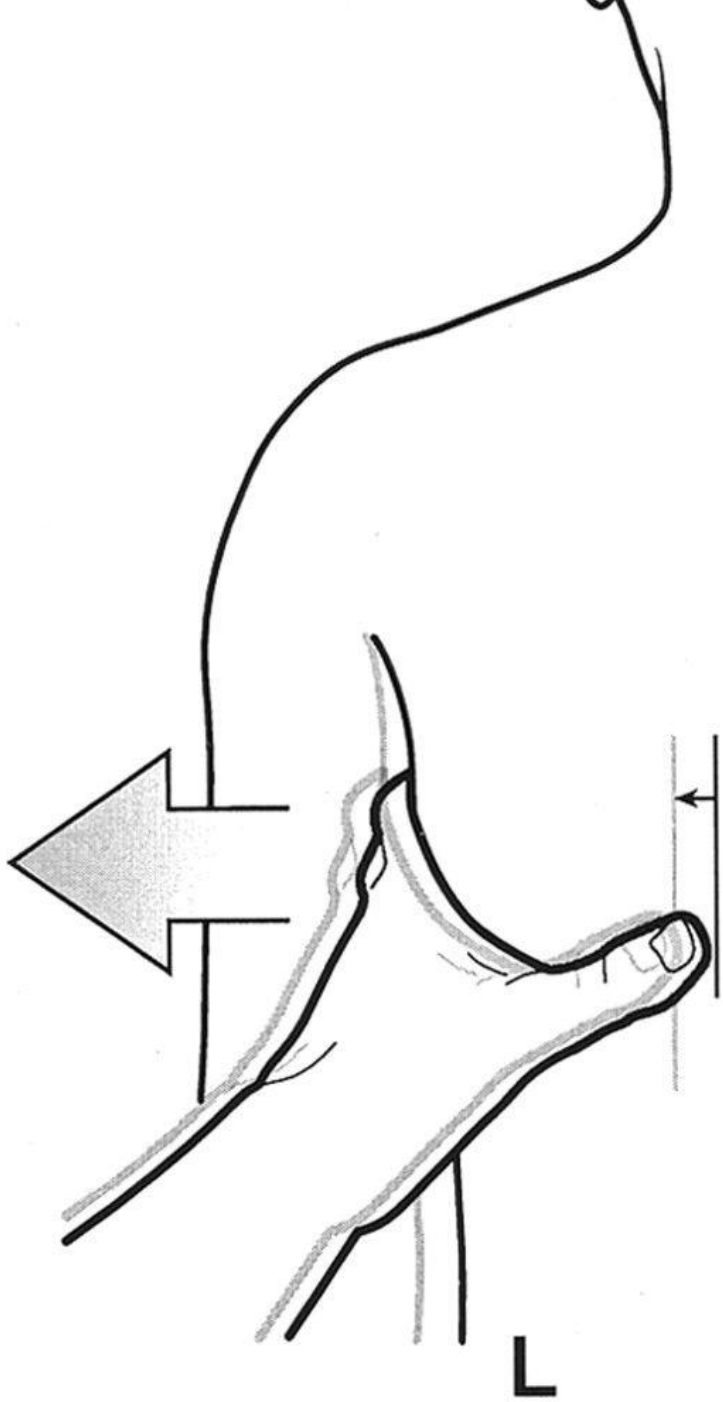
Inspection:

- See Any Asymmetry or deformity Present Or not
 - Such as –wasting or dropping of shoulder
 - Deformity of spine such
 - Kyphosis
 - *Scoliosis*
 - Kyphoscoliosis
- Movement Of The Chest
 - Any restriction of movement upper / middle / or lower zone
- Evidence of respiratory distress
 - Intercostals fullness or recession / in drawing
- Scar mark, visible impulse and Engorged vein present or not
- spider nevi and pigmentation and fungal infection

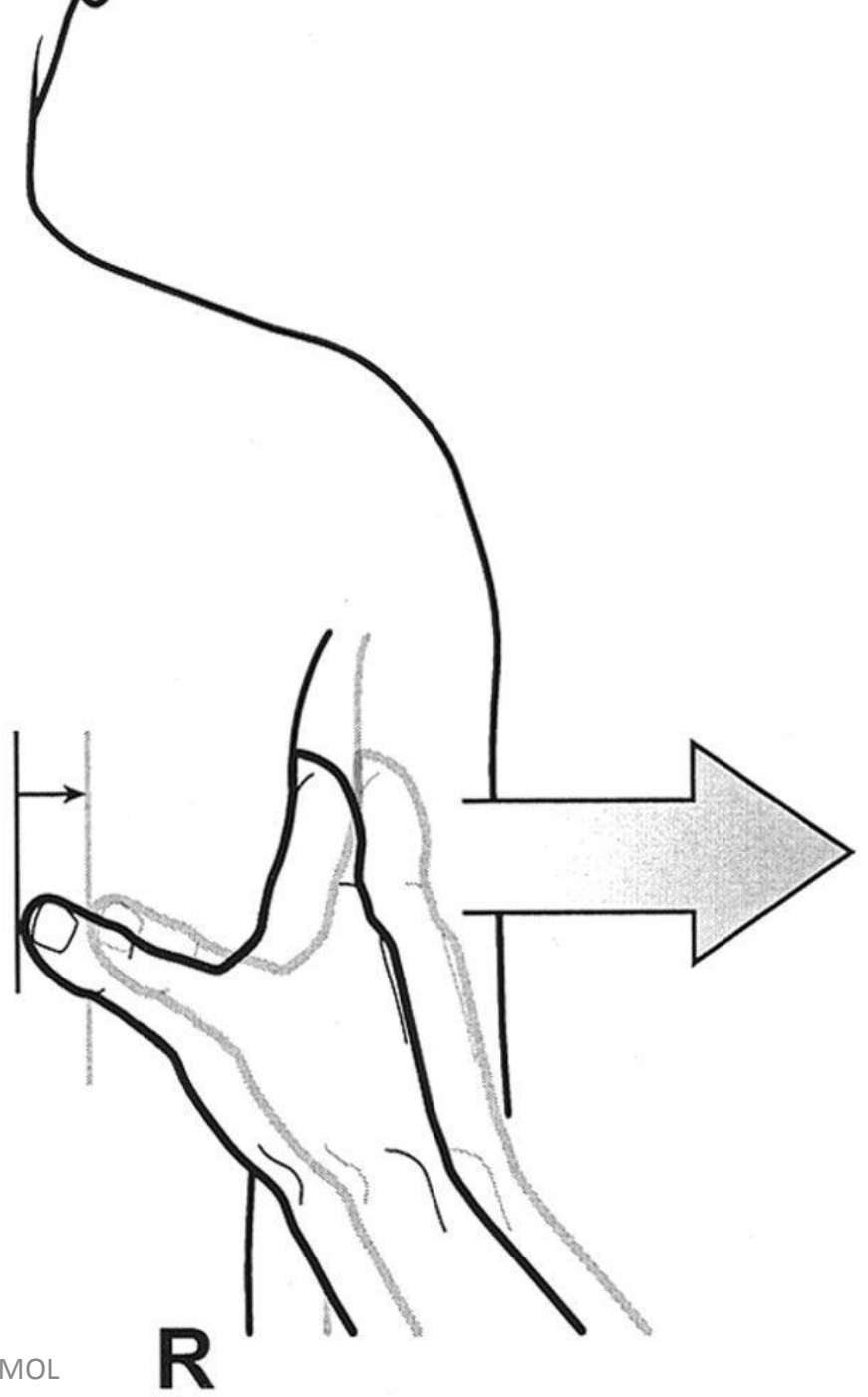


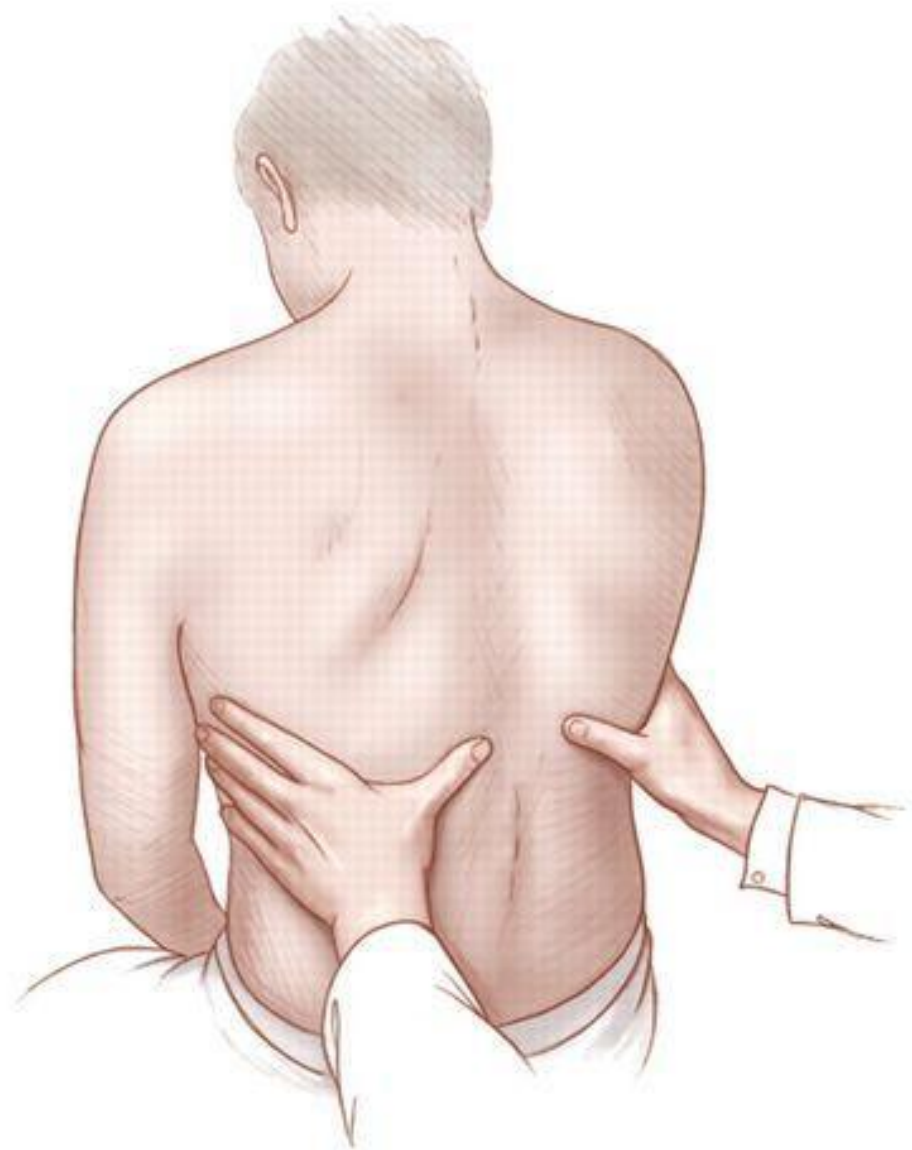


Expansibility of chest



DR SHAMOL





At apex

Step .1: Place u r both hand firmly (not tightly) on the patient chest in such a position that all the extending fingers remain on the patients on the apex of lung

Step .2. : Now place your thumbs in such way that they touch each other in the mid line Over the spine of vertebra and in between the thumb there skin in folded position .

Step 3 : Look care fully that tip of thumbs do no touch the chest wall

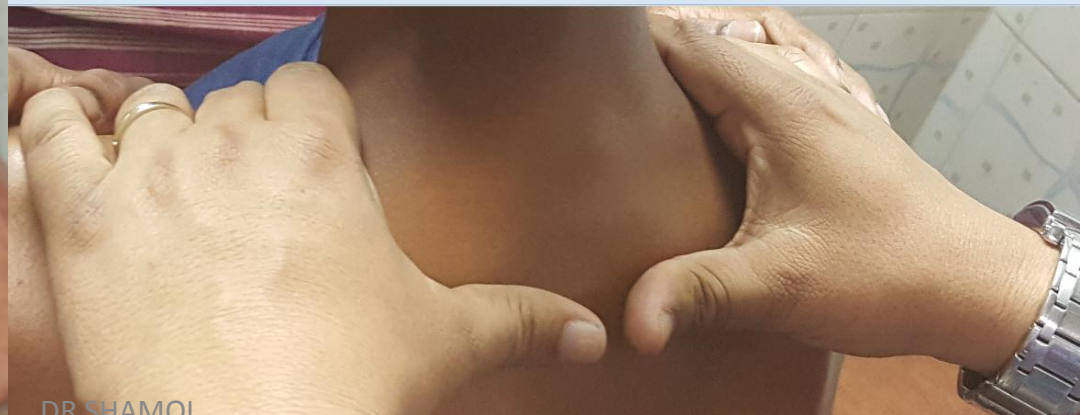
Stop 4: Ask the patient to take a deep breath.

Step 5 : As they do this, watch your thumbs

Your thumbs should move symmetrically apart in normal case

If you look that one thumbs is moving less apart from other

Then it indicate that there is reduction expansion of chest on that side



DR SHAMOL

At the middle zone

Step .1: Place u r both hand firmly (not tightly) on the patient mid chest in such a position that all the extending fingers remain on the mid lateral surface of the patients lung

Step .2. : Now place your thumbs in such way that they touch each other in the mid line at Over the spine of vertebra and in between the thumb skin remained folded position

Step 3 : Look care fully that tip of thumbs do no touch the chest wall

Stop 4 : Ask the patient to take a deep breath

Step 5 : As they do this, watch your thumbs for symmetrical movement



DR SHAMOL



DR SHAMOL

Lower Zone

Step .1: Place u r both hand firmly (not tightly) on the patient lower chest in such a position that all the extending fingers remain on the lower lateral surface of the patients lung

Step .2 : Now place your thumbs in such way that they touch each other in the mid line Over the spine of vertebra and in between the thumb there skin in folded position

Step 3 : Look care fully that tip of thumbs do no touch the chest wall

Stop 4 : Ask the patient to take a deep breath

Step 5 : As they do this, watch your thumbs for symmetrical movement



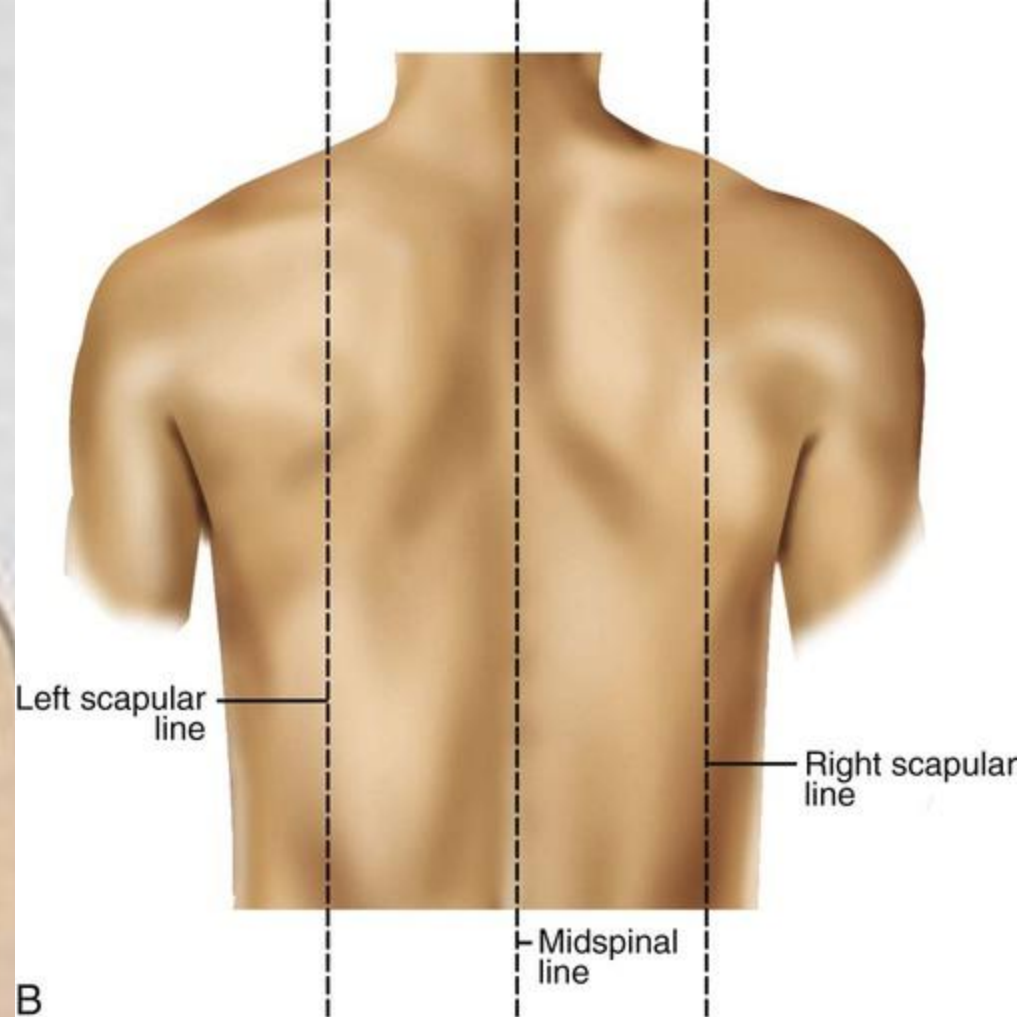
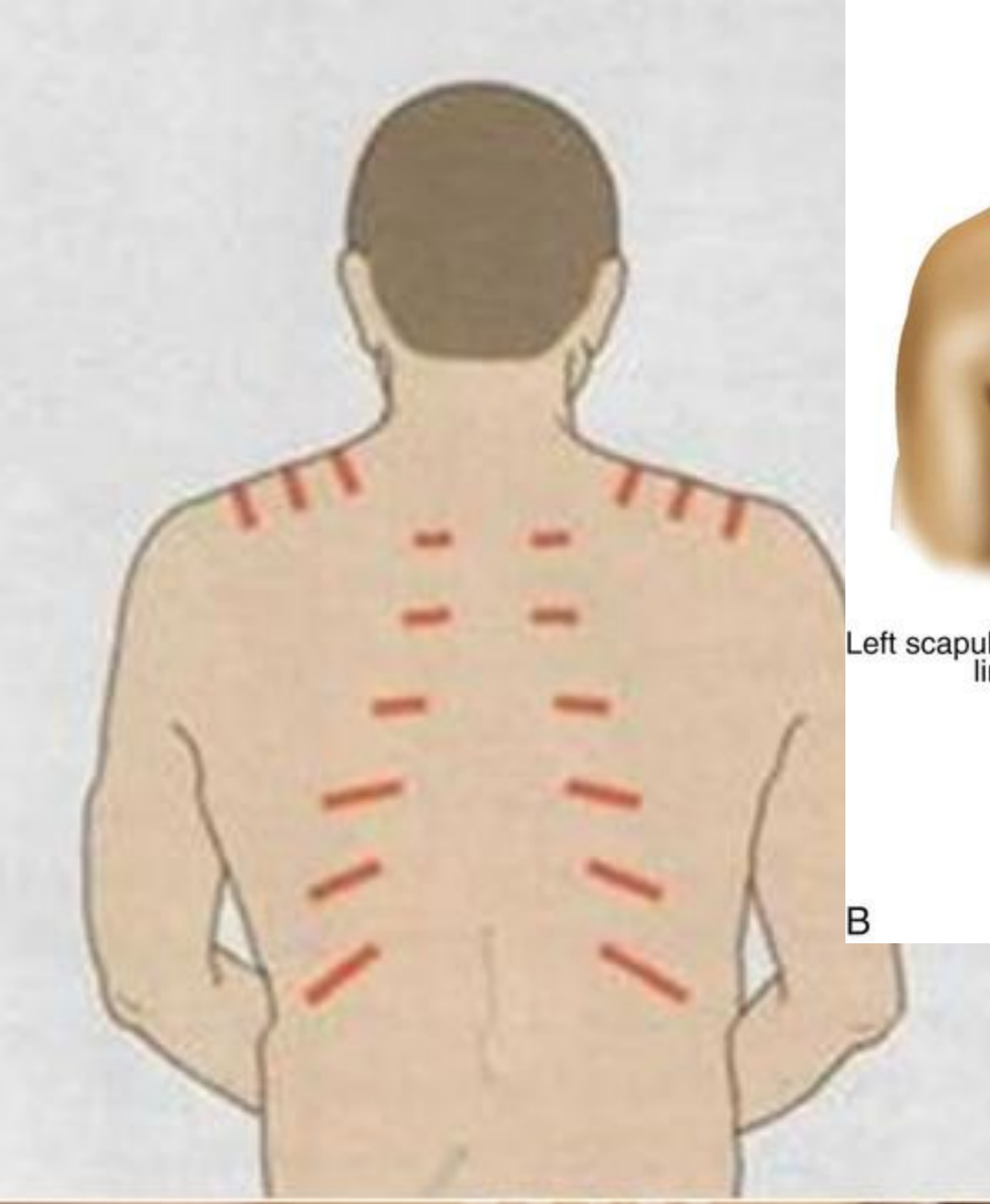
DR SHAMOL



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PERCUSSION

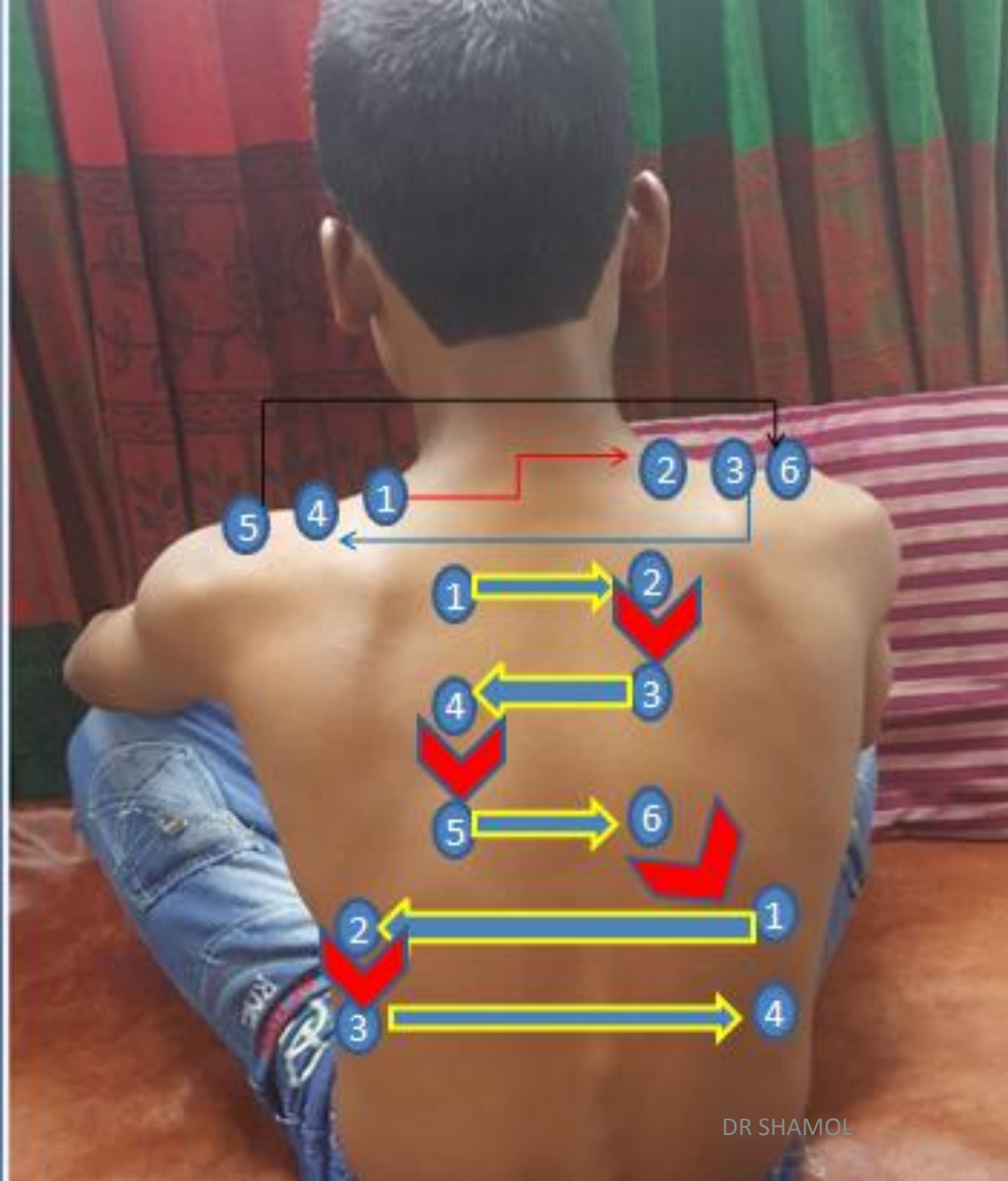


Percussion

Over of trapezius

Para –scapular
region

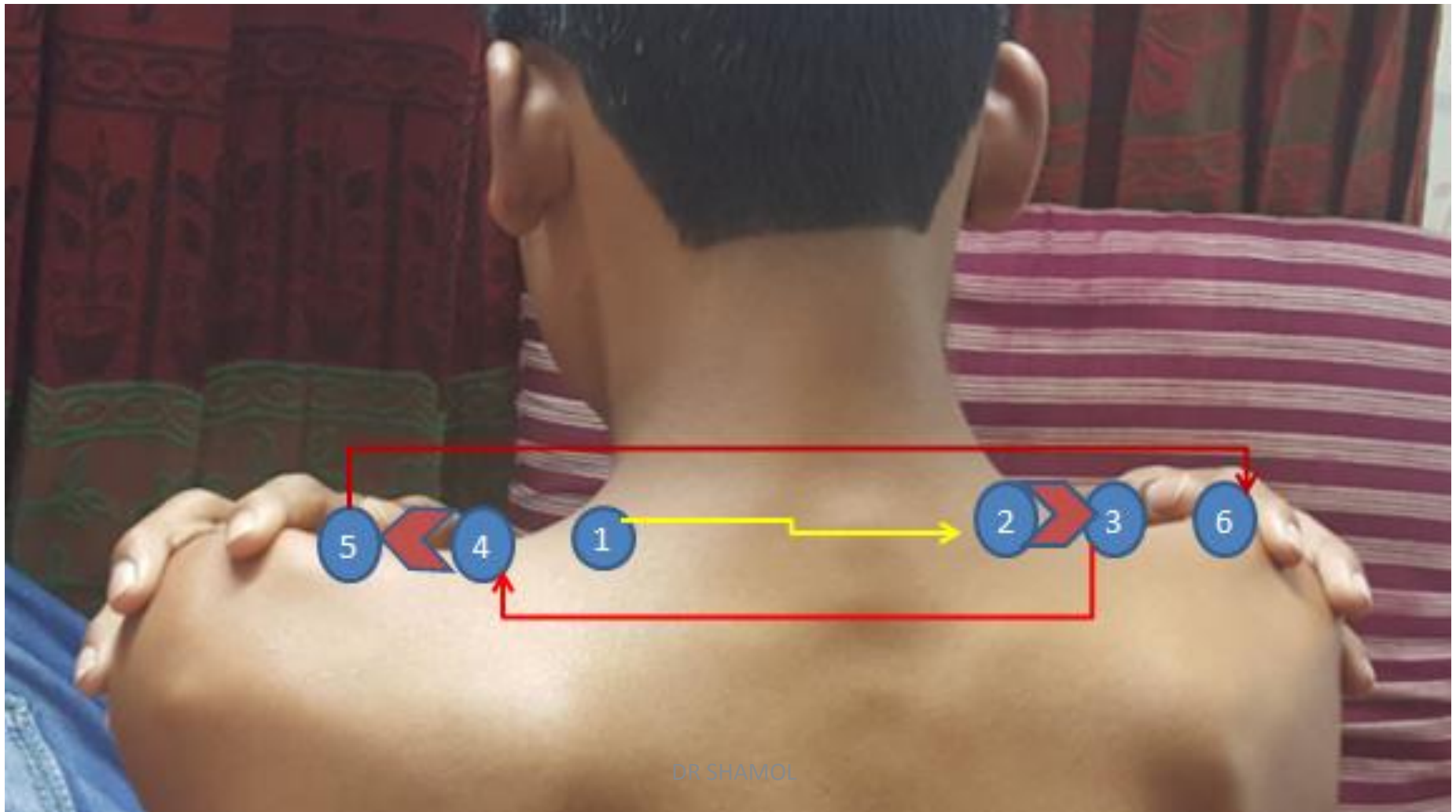
Infra-scapular
region





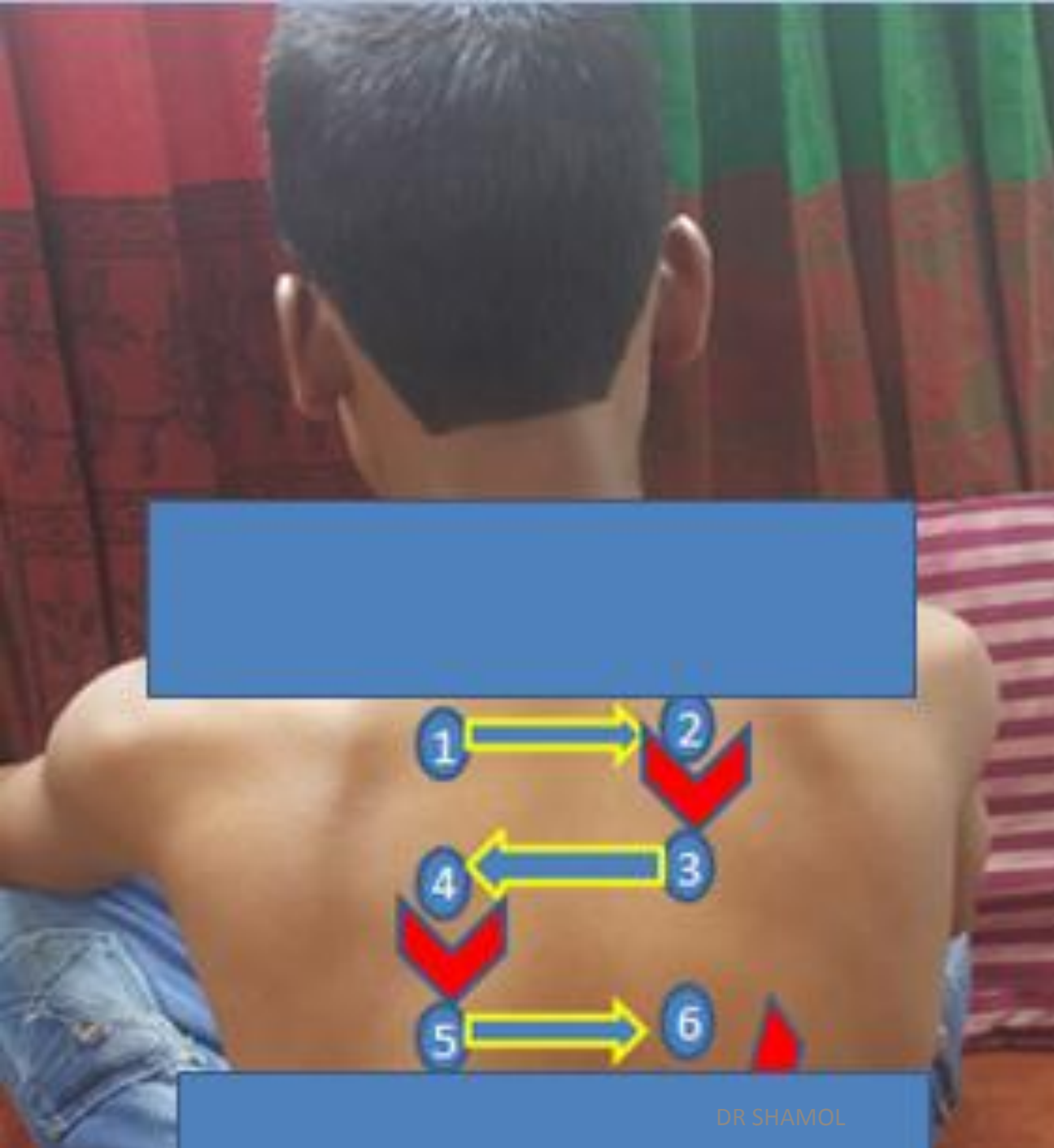
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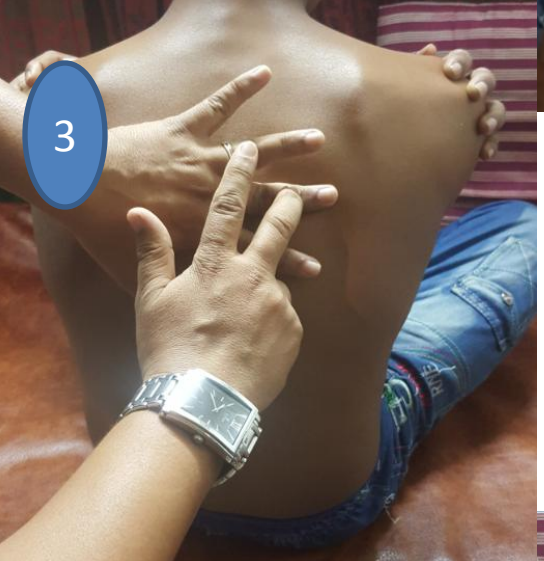
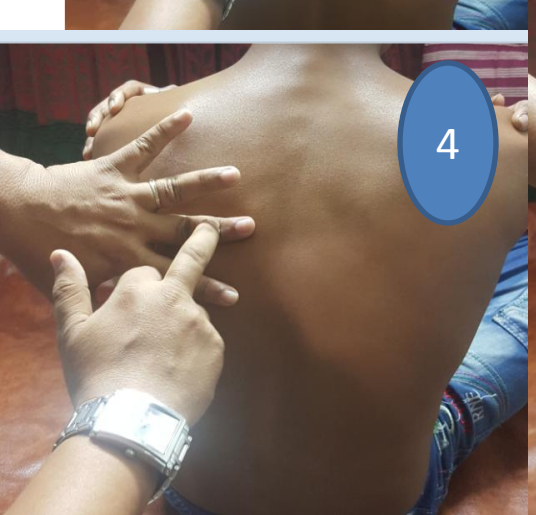
Over





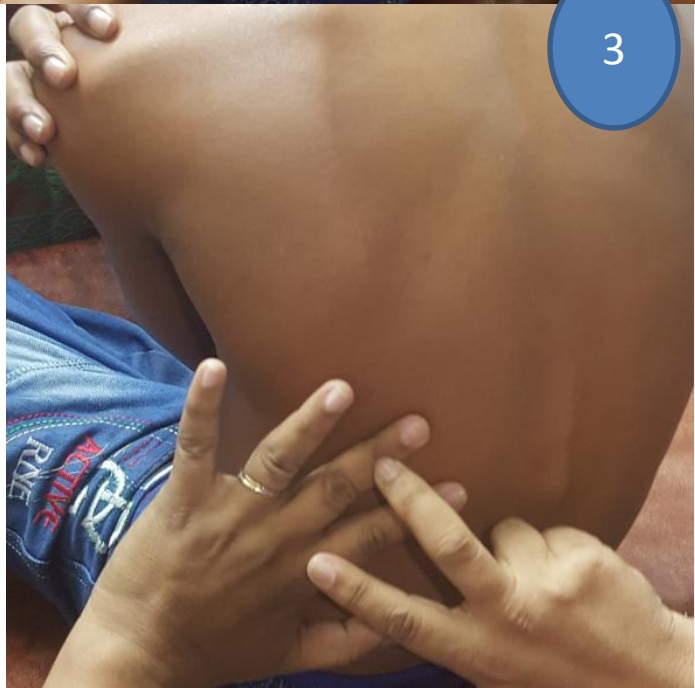
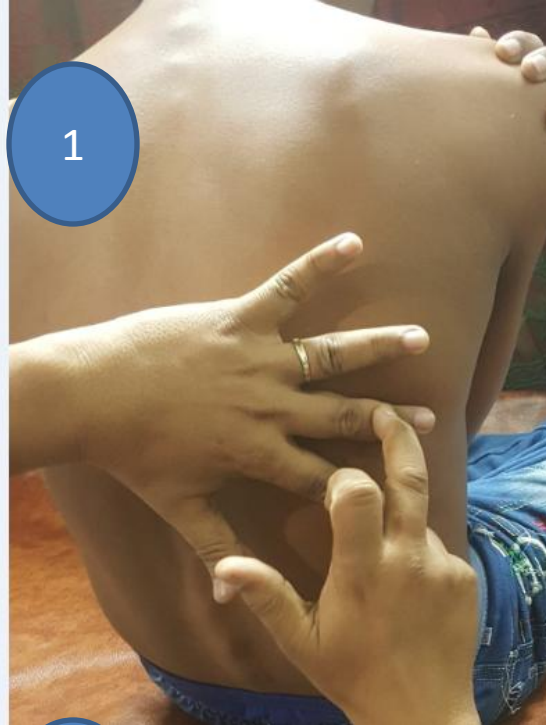
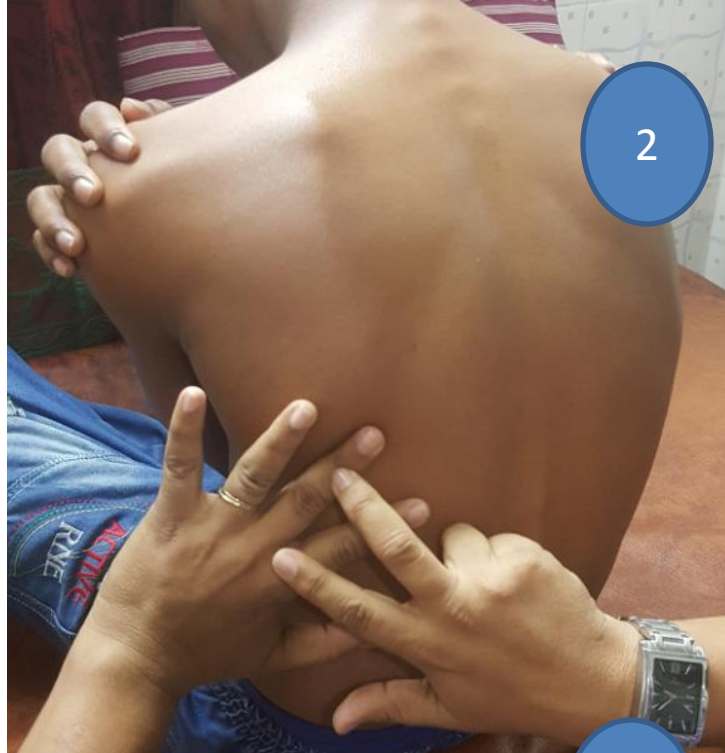
Intra scapular region





Infra-scapular region

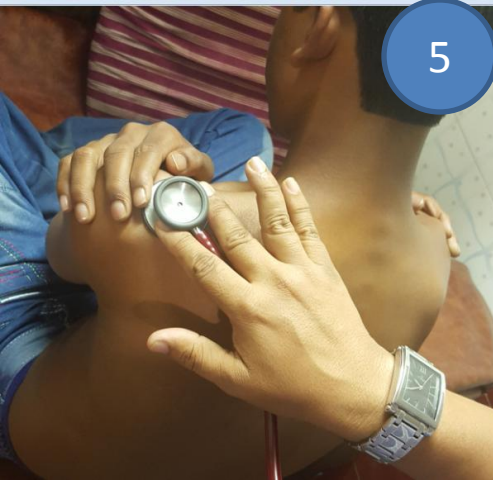
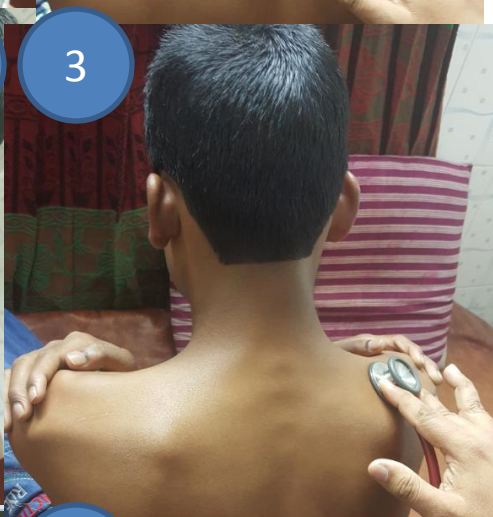
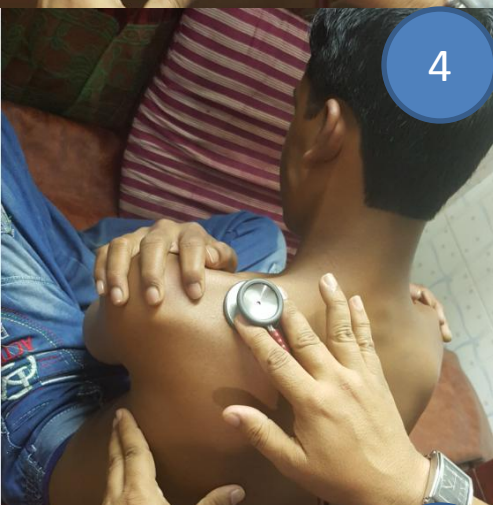


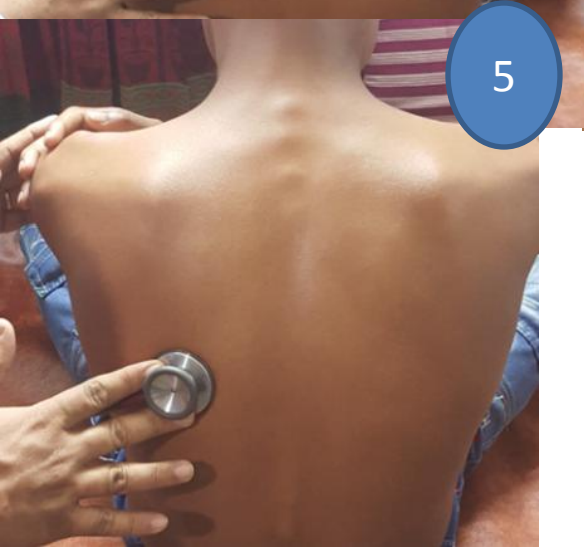


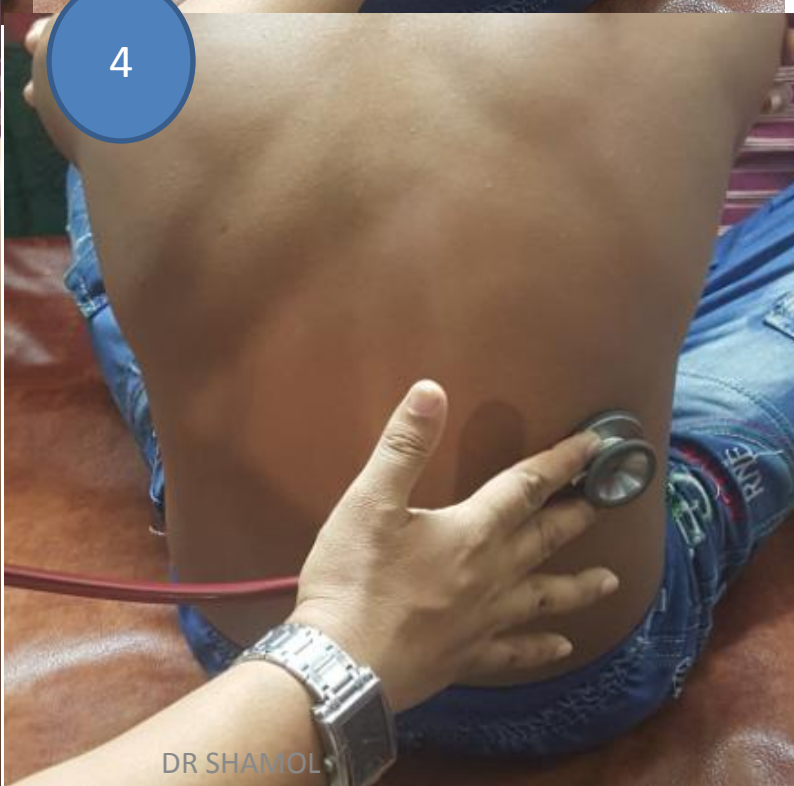


DR SHAMOL











If you get crepitating over lung
Then ask the patient to cough
Again listen for any alteration of creps

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Remember all
crepitation alter
after coughing
except in ILD



How will u see the Basal crep (++):

By place diaphragm of the stethoscope but bellow the angle of scapula and ask the patient to take deep breath. Listen for crep at end of inspiration
Listen it bilaterally

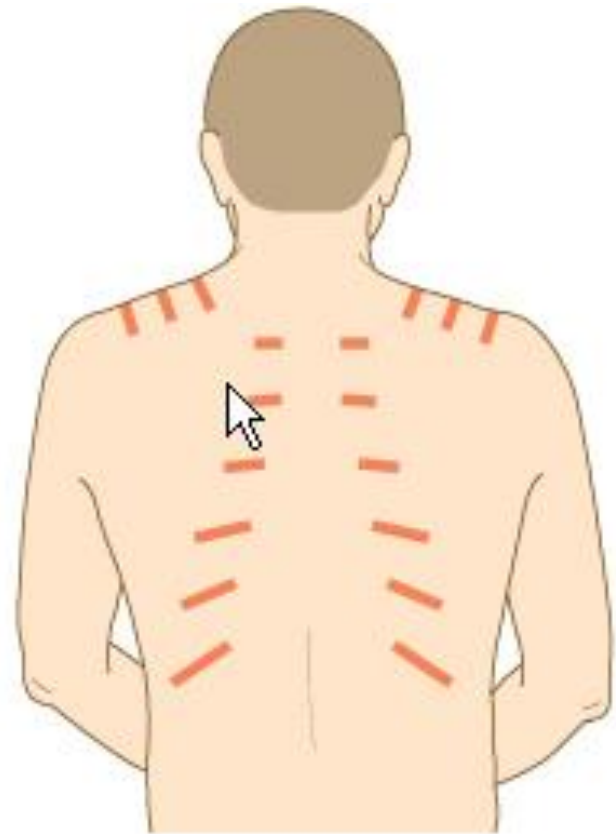
Vocal
resonance



- Method of vocal resonance will be same as that u learn in examination in lying position. auscultation /
- Sequence of vocal resonance will follow that of auscultation

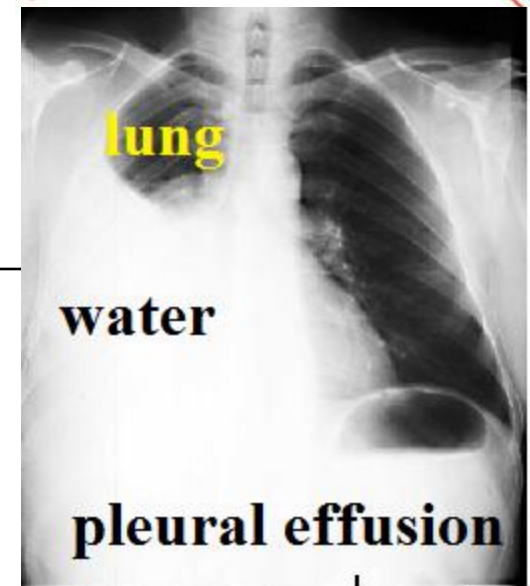
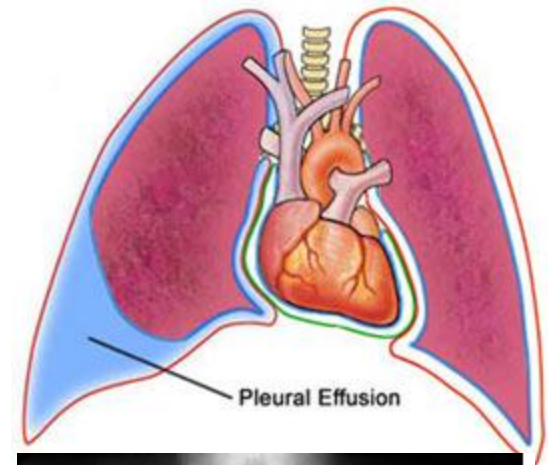
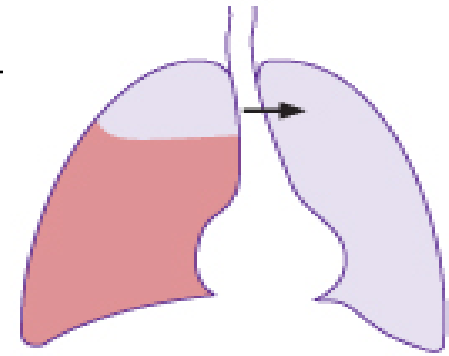
Remmemer

- Apex should be auscultated with bell of the stethoscope rest other are diaphragm
- Stethoscope should be place in such a way that it do not come in mid line so during auscultation keep the stethoscope as laterally as possible
- Ask the patient to utter ninty nine every time when you place your stethoscope on chest

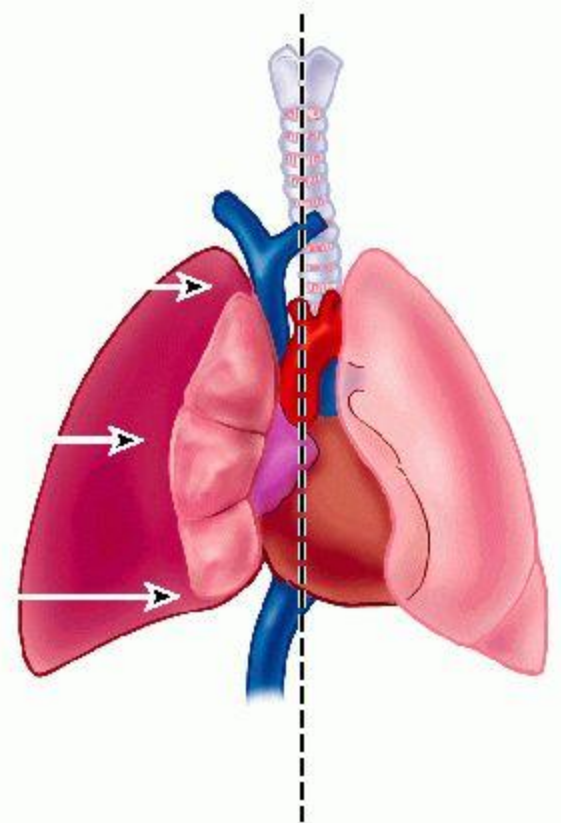


Pleural effusion

Inspection	Restriction of movement of right lower and middle chest .
Palpation	<ul style="list-style-type: none"> • Trachea is deviated toward left • Chest expansibility reduce on right mid and lower Zone • Vocal fremitus diminish in right and mid zone
Percussion	Stoney dull on right mid and lower Zone
Auscultation	Breath sound is diminish / absent & Vocal resonance absent or decreased On right mid and lower Zone

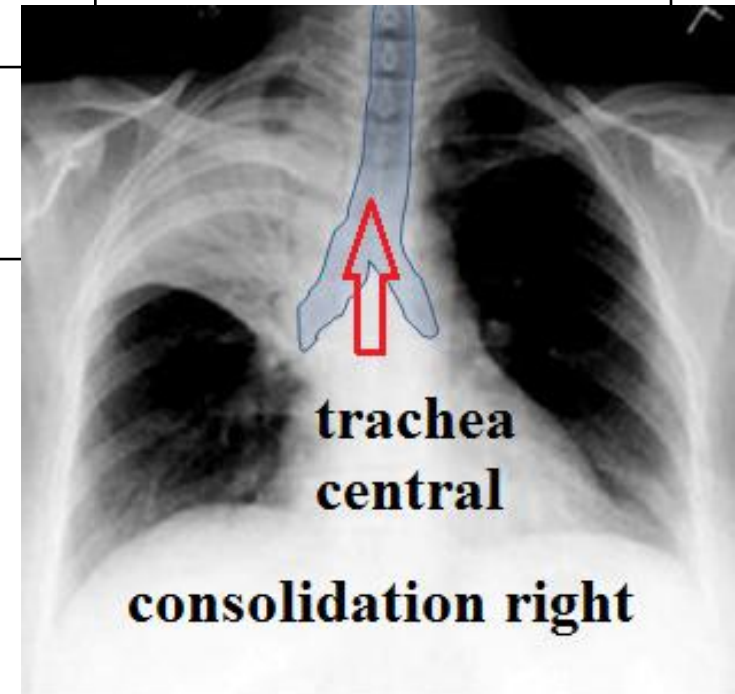
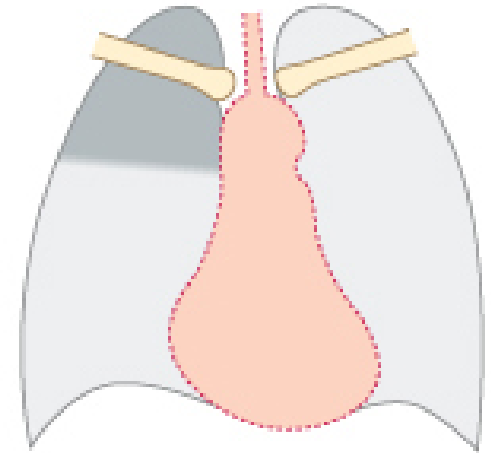


Right sided Pneumothorax	
Inspection	Restriction of movement of right side of chest
Palpation	<ul style="list-style-type: none"> • Trachea is deviated to the left • Chest expansibility reduce right side • Vocal fremitus diminish or reduced right side
Percussion	• Hyper resonance on right side
Auscultation	Breath sound is absent or diminish & Vocal resonance absent diminish On right side of chest



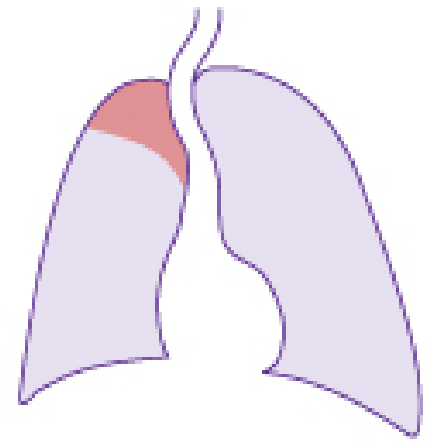
Consolidation (right upper ZONE)

Inspection	Restriction of movement of right upper chest
Palpation	<ul style="list-style-type: none"> • Trachea is in central • Chest expansibility reduce on right upper Zone • Vocal fremitus increased right upper Zone
Percussion	• Woody dull on right right upper Zone
Auscultation	Breath sound is bronchial & Vocal resonance increased On right right upper Zone

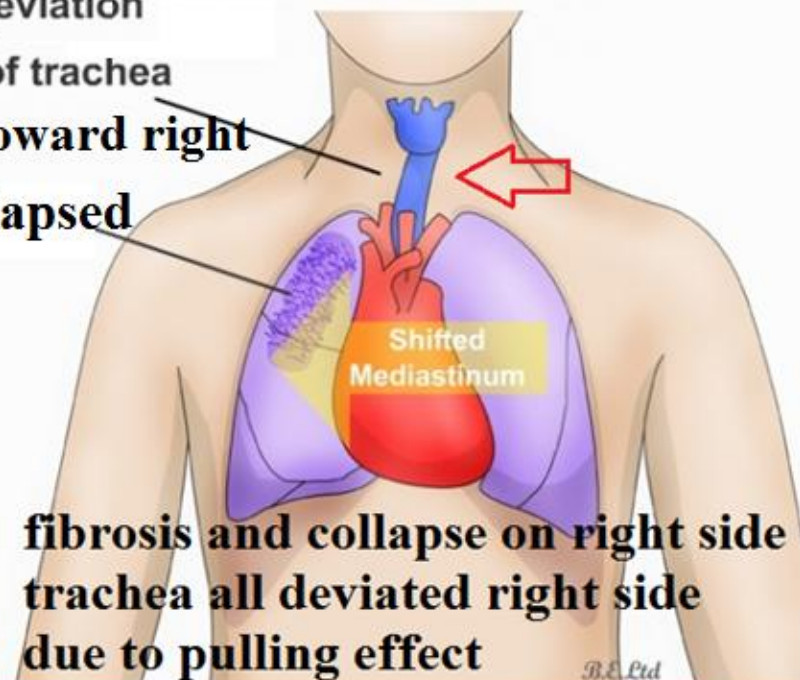


Peripheral collapse (with patent bronchus) right upper Zone

Inspection	Restriction of movement of right upper chest
Palpation	<ul style="list-style-type: none"> • Trachea is deviated to the right • Chest expansibility reduce on right upper Zone • Vocal fremitus increased right upper Zone
Percussion	• dull on right right upper Zone
Auscultation	Breath sound is bronchial & Vocal resonance increased On right right upper Zone

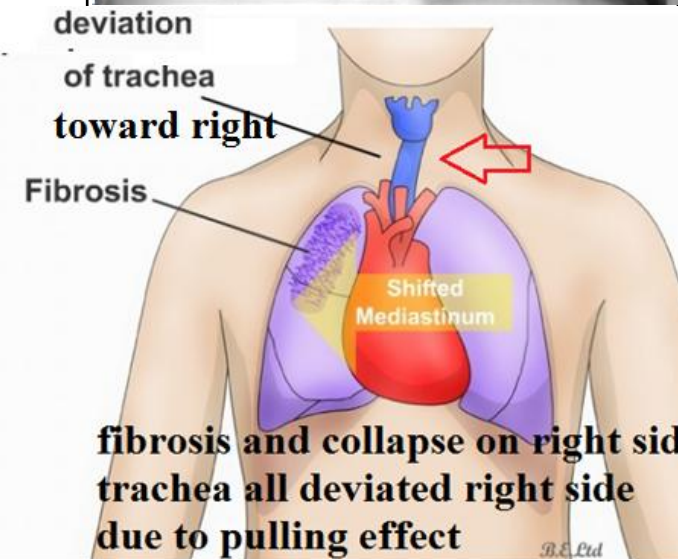
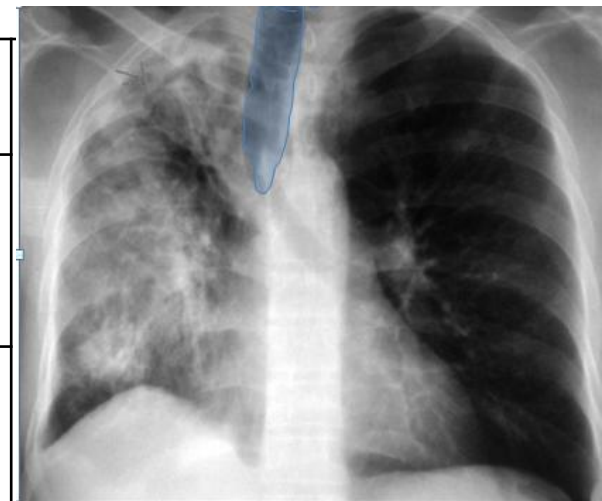


deviation
of trachea
toward right
collapsed



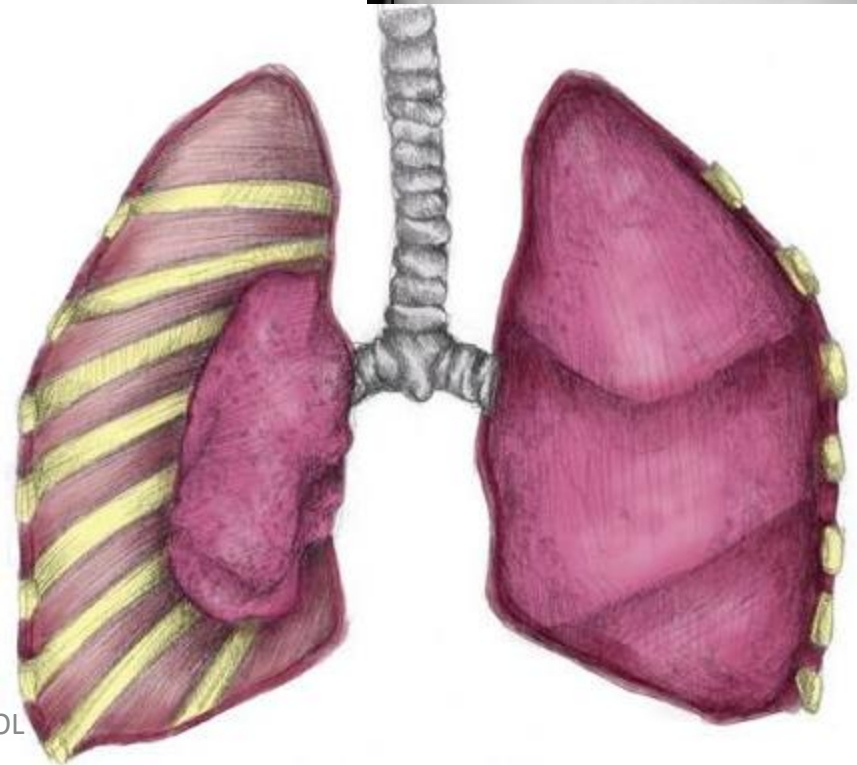
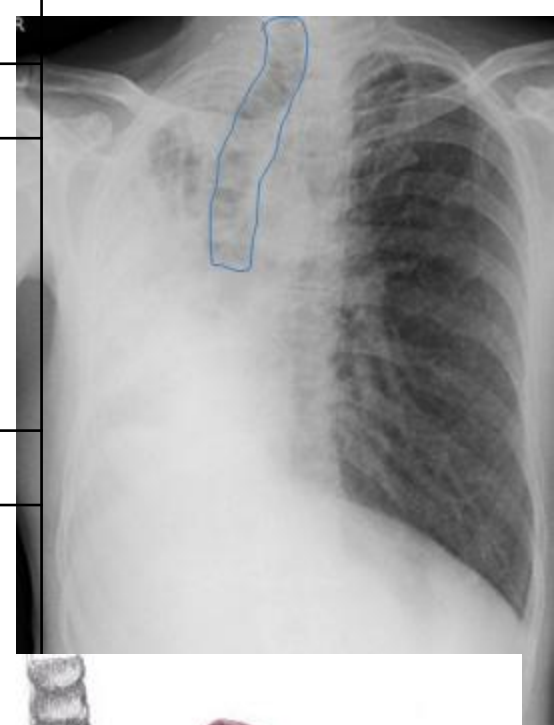
Fibrosis of Right upper Zone

Inspection	Restriction of movement of right upper chest Wasting ,flattening , dropping of shoulder
Palpation	<ul style="list-style-type: none"> • Trachea is deviated to the right • Chest expansibility reduced on right upper Zone • Vocal fremitus increased on right upper Zone
Percussion	<ul style="list-style-type: none"> • Dull on right upper Zone
Auscultation	<ul style="list-style-type: none"> • Breath sound is bronchial & • Vocal resonance increased <p>On right upper Zone</p>



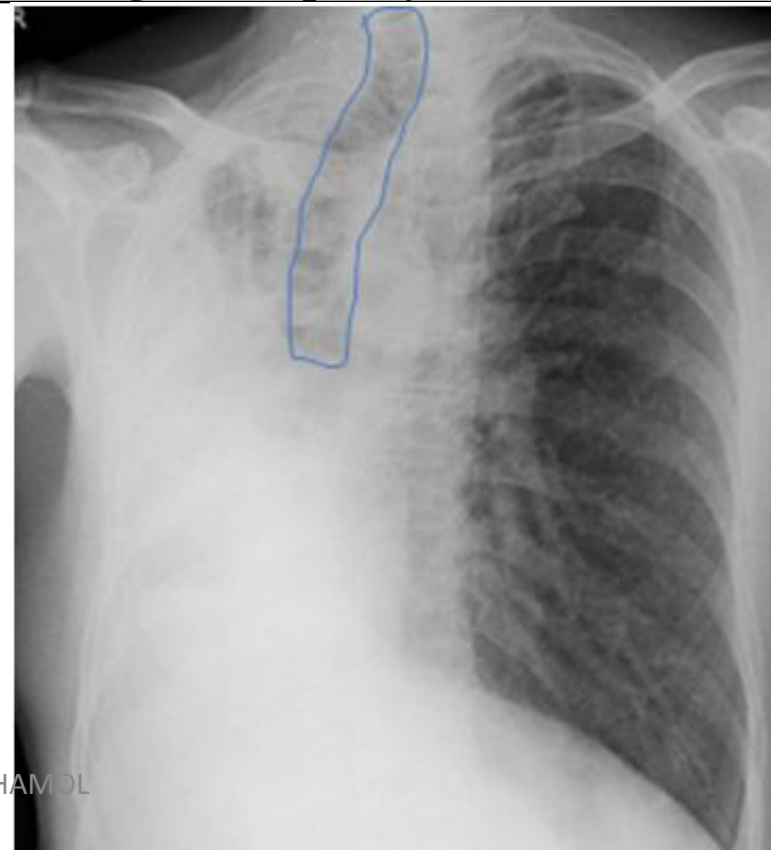
Central collapse (with out patent bronchus) right Zone

Inspection	Restriction of movement of right upper chest
Palpation	<ul style="list-style-type: none">• Trachea is deviated to the right• Chest expansibility reduce on right upper Zone• Vocal fremitus diminish or reduced on right upper Zone
Percussion	<ul style="list-style-type: none">• Dull on right right upper Zone
Auscultation	Breath sound is absent or diminish & Vocal resonance absent diminish On right right upper Zone

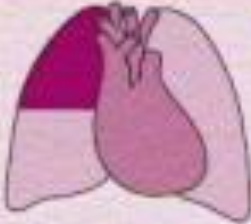
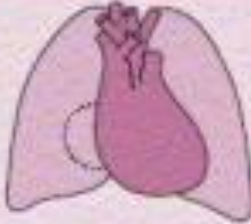
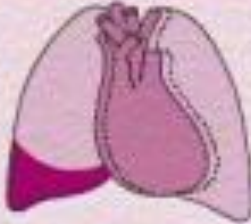
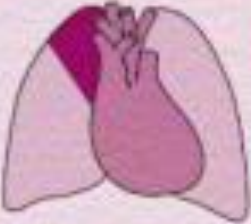



How will u differentiate between fibrosis and collapse (peripheral collapse)

Fibrosis	Collapse
<p data-bbox="98 129 942 244">Fibrosis is a long standing process that why.</p> <ul data-bbox="98 244 942 415" style="list-style-type: none"><li data-bbox="98 244 942 301">• wasting of chest muscle ,<li data-bbox="98 301 942 358">• Flattening chest and<li data-bbox="98 358 942 415">• Rib crowding <p data-bbox="98 415 942 529">are more marked on fibrosis then collapse</p>	<p data-bbox="942 129 1785 244">This are absent or if present then are less marked</p>
Radiological---non homogenous opacity	Homogenous opacity

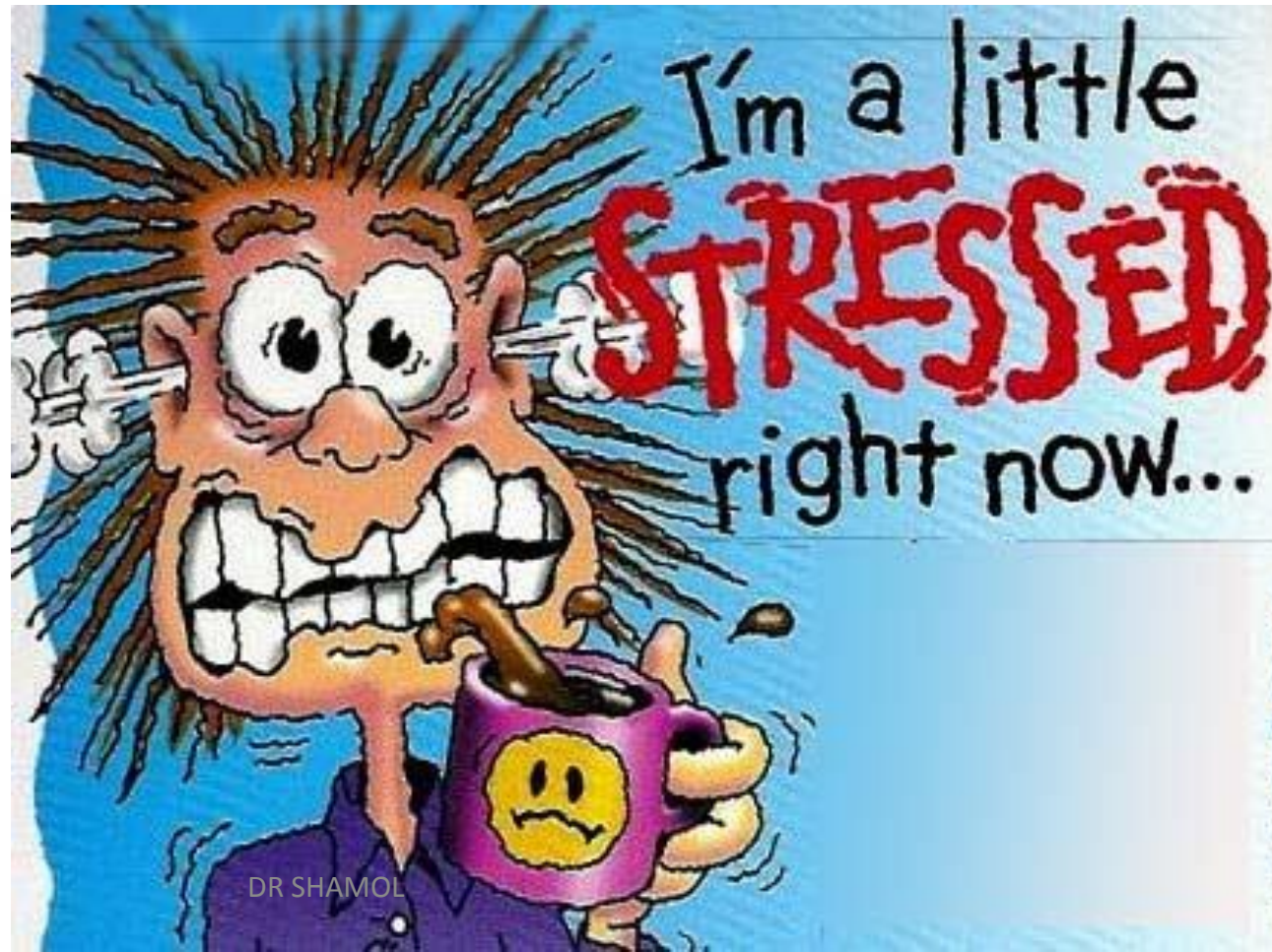


Signs found on examination of the respiratory system

	Consolidation	Pneumothorax	Pleural effusion	Lobar collapse	Pleural thickening
Chest radiograph					
Mediastinal shift and trachea	none	opposit the affected side	none	towards the affected side	none
Chest wall excursion	normal or decreased on the affected side	normal or decreased on the affected side	normal or decreased on the affected side	decreased	decreased
Percussion note	dull	resonant	stony dull	dull	dull
Breath sounds	increased (bronchial)	decreased	decreased	decreased	decreased
Added sounds	crackles	click (occasional)	rub (occasional)	none	none
Tactile vocal fremitus or vocal resonance	increased	decreased	decreased	decreased	decreased



Short Case



Short case one ---

u will get pleural effusion or normal chest

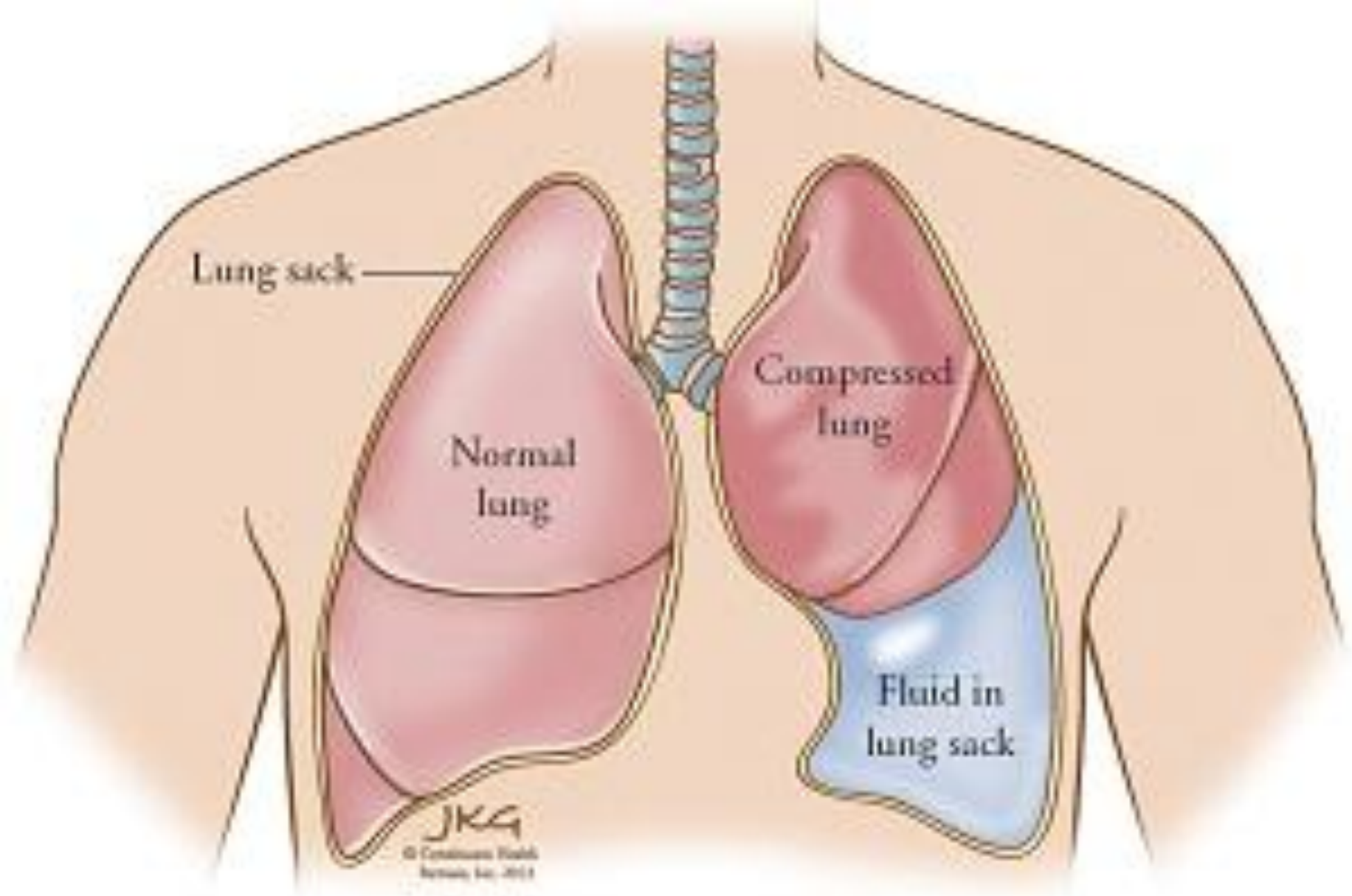
Ask to examine chest anteriorly or from the back

A short case ----

right sided/left sided pleural effusion

Do according to procedure

Never miss to mention about any pigmentation , scar mark ,fungal infection , any bandage or canula or aspiration marks .



Examination of respiratory system Examination of this old cachetic patient reveals that size and shape of the chest wall is normal .There is restricted Chest movement in left lower part and respiratory rate is 15 / min with normal rhythm and pattern .There is no supra sternal , supra clavicular or intercostals recession .

Trachea: deviated to the right (may be Central in position). Apex beat: normal ,
Decreased expansibility of left lower chest or movement is restricted left lower lung

Percussion: reveals Stony dull

Anteriorly from left 5th intercostal space to downwards along midclavicular line And laterally left 6th intercostal space to downwards along midaxillary line and posteriorly left 7th intercostal space to downwards along infrascapular line & Normal in other part of the chest.

Breath sound absent, and vocal resonance Diminished at above mentioned area. And rest of area are normal with vesicular breath sound . ther is no added sound

My clinical diagnosis ----left sided pleural effusion

Why u called it pleural effusion?

Trachea shift to right side (only in massive effusion)

Percussion stony dull

Vocal resonance and Fremitus --- decreased

Breath sound ---- decrease

Why this not a case of consolidation ?

In Consolidation following are present

Trachea central and

breath sound bronchial,

Vocal resonance and Fremitus --- increased

Percussion –woody dull

Why this not a case of fibrosis

In Fibrosis

Trachea same side and
breath sound bronchial
Vocal resonance and Fremitus --- increased
wasting of over lying chest ,
Rib crowding present (space between
corresponding rib is decrease)

**How will u confirm
the pleural effusion
at bed side ?**

By aspiration of fluid

Why this not a case of collapse

If bronchus is patent

Trachea shifted same side
Bronchial breath sound

If bronchus is not patent

Trachea shifted same side
Breath sound diminish

Examine the chest from the back

Decreased expansibility of left lower chest or movement is restricted left lower lung

Percussion: reveals Stony dull posteriorly from left 7 intercostal space to downwards along midscapular line And Normal in other part of the chest.

Breath sound absent, and vocal resonance Diminished at above mentioned area.

And rest of area are normal with vesicular breath sound . there is no added sound

Q. What is your diagnosis ?

Remember that in examination of chest you never tell that this is a pleural effusion rather you should ans this way

“ sir I have some differential diagnosis

Pleural effusion

Collapsed

Mass lesion

Thicken pleura “

Q . How will differentiate them?

By seeing trachea anteriorly

If trachea is

Shifted to opposite site –then DX is—pleural effusion

Same site --then DX is—collapsed

Central -then DX is— mass less / thicken pleura

What may be the cause of pleural effusion in this patient

Sir want to do some relevant such as

- I want to see clubbing ,
- Cervical lymph node

Feature of horners syndrome (,Ipsilateral partial ptosis,Enophthalmos, anhydrosis)

- Hoarseness of voice

Feature of SVC obstruction

Most common causes unilateral effusion

common causes

3PM

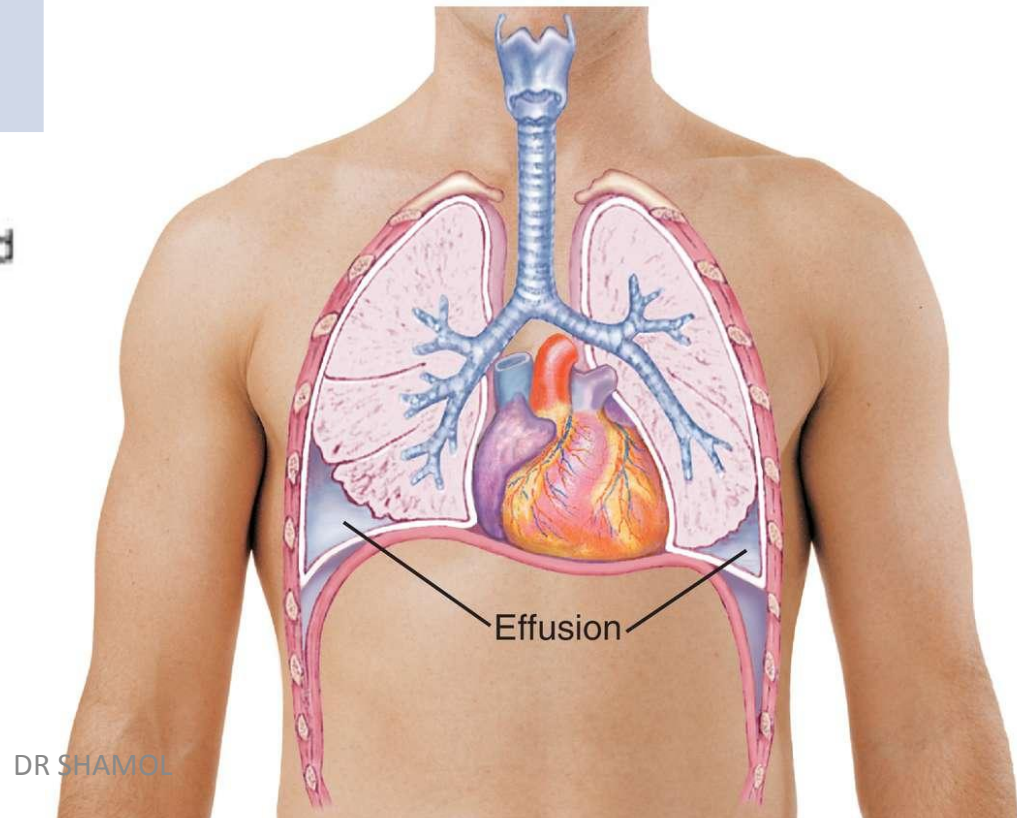
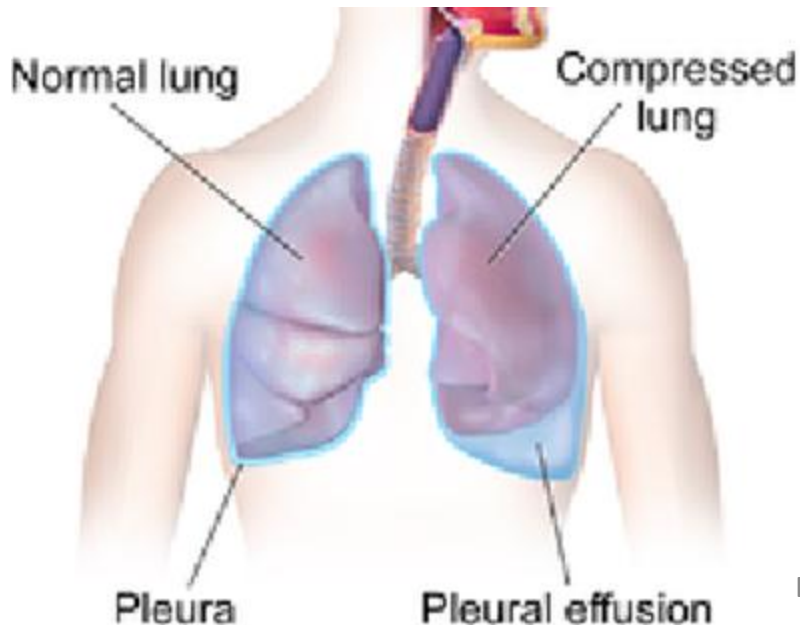
1. Pulmonary Tuberculosis
2. Pneumonia ('parapneumonic effusion')
3. Pulmonary infarction*
4. Malignant disease
 - a. bronchial carcinoma old
 - b. lymphoma --young

Bilateral effusion

common causes :

to remember 3 system heart , liver, kidney , GIT

1. Heart--CCF
2. Liver--cirrhosis of liver
3. Kidney --nephrotic syndrome / CKD





tuberculosis

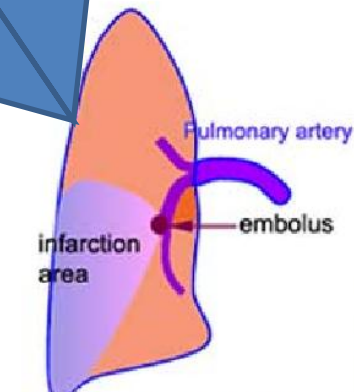
Most
common
Cause of
pleural
Effusion



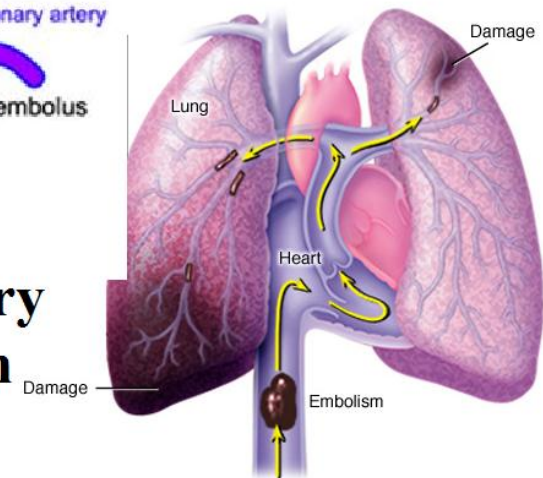
bronchial carcinoma



pneumonia



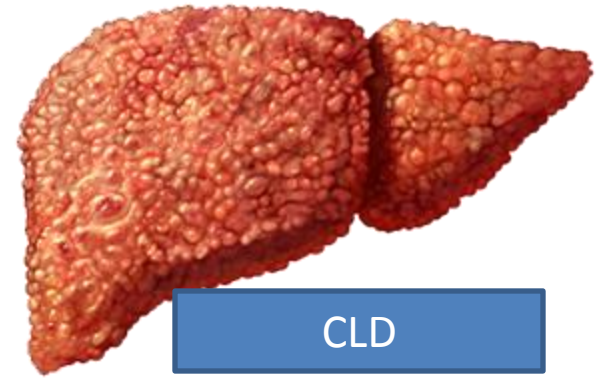
pulmonary
infarction



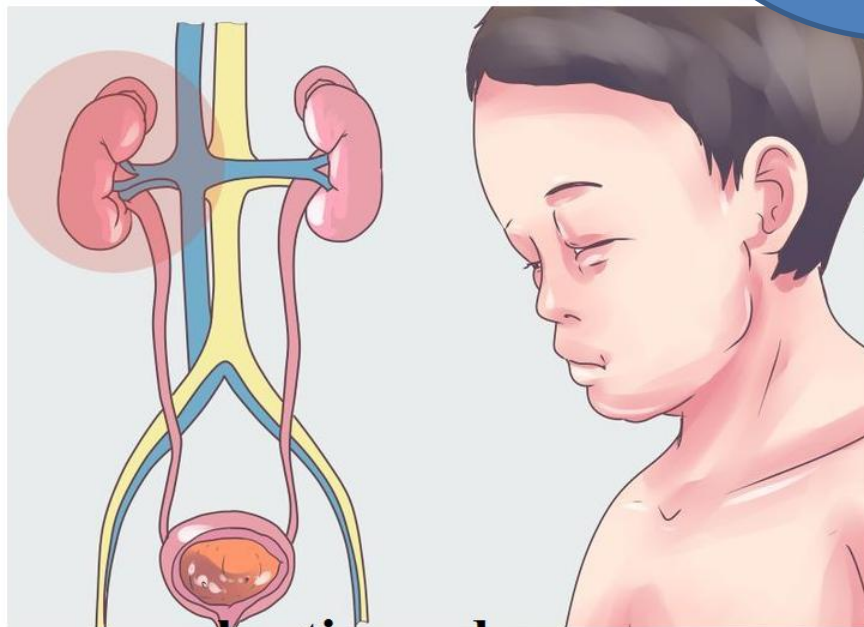


CCF

**Bilateral
pleural
effusion**



CLD



nephrotic syndrome

DR SHAMOL



-malabsorption /
malnutrition /
protein losing enteropathy

Define pleural effusion?

Accumulation of abnormal -amount of fluid in pleural cavity is called pleural effusion ?

When will tell it is exudative and transudative ?

- exudative If protein more than > 3 gm Exudative
- transudative--- If protein more than < 3 gm Exudative

what is LIGHT'S CRITERIA

Pleural fluid is an **exudate** if one or more of the following criteria are met:

- Pleural fluid protein:serum protein ratio > 0.5
- Pleural fluid LDH: serum LDH ratio > 0.6
- Pleural fluid LDH $>$ two-thirds of the upper limit of normal serum LDH

4 important causes of exudative pleural effusion

Pulmonary tuberculosis

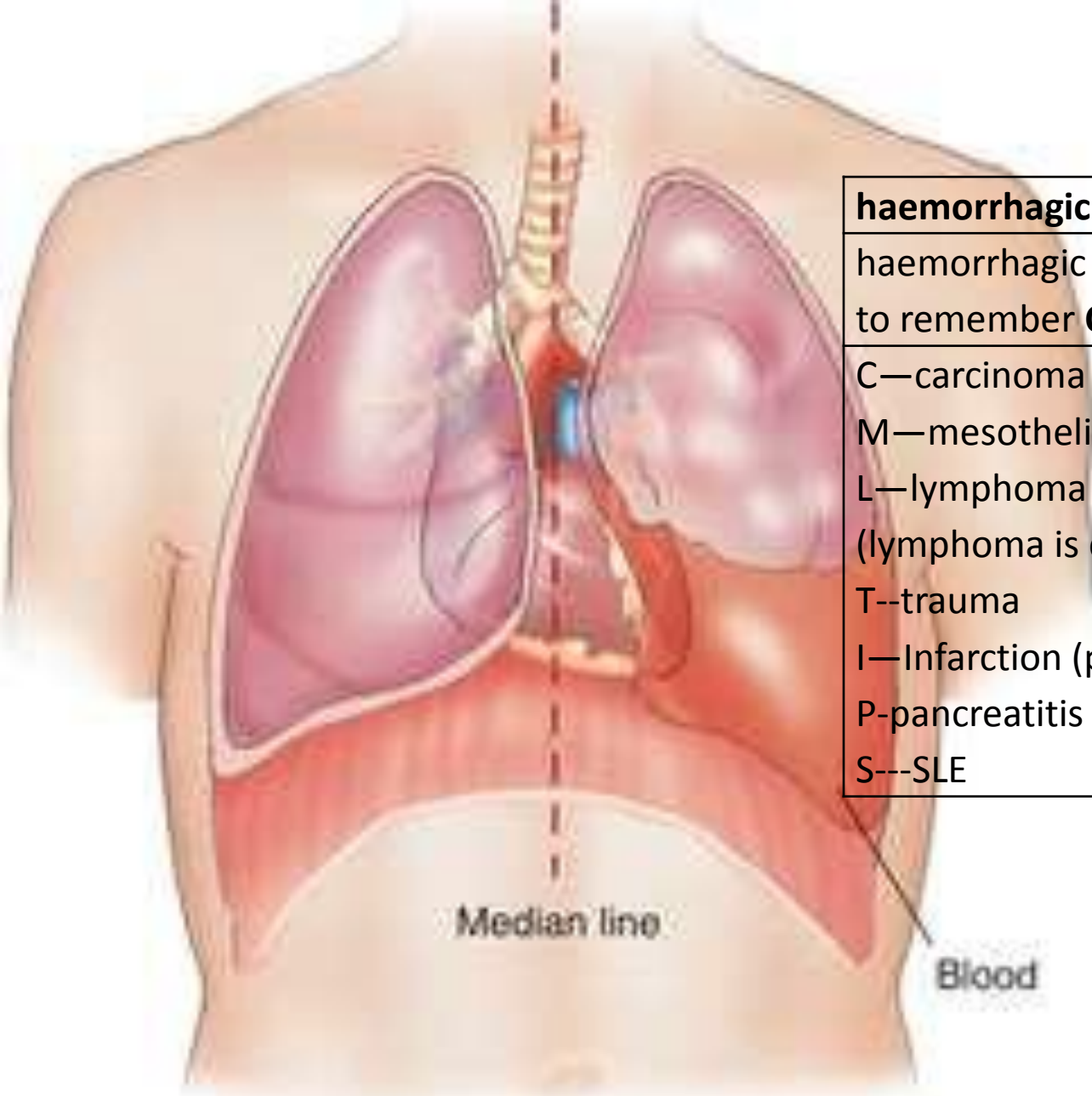
Para-pneumonic

Bronchial carcinoma

Pulmonary infarction

exudative	transudative
<p>common causes</p> <p>MP3</p> <ol style="list-style-type: none"> 1. Malignant disease <ol style="list-style-type: none"> a. bronchial carcinoma old b. lymphoma --young 2. Pulmonary Tuberculosis 3. Pneumonia ('parapneumonic effusion') 4. Pulmonary infarction* <p>uncommon --MCPS</p> <p>M—mesothelioma (pleural mesothelioma)</p> <p>C—connective tissue disease</p> <ol style="list-style-type: none"> a) SLE b) RA <p>P—pancreatitis</p> <p>S—subdiaphragmatic</p> <ol style="list-style-type: none"> a) subphrenic abscess b) liver abscess <p>other</p> <p>Dressler syndrome</p> <p>(Post-myocardial infarction syndrome)</p>	<p>common causes :</p> <p>to remember 4 system heart , liver, kidney , GIT</p> <ol style="list-style-type: none"> 1. Heart--CCF 2. Liver--cirrhosis of liver 3. Kidney --nephrotic syndrome / CKD 4. GIT--malabsorption / malnutrition / protein losing enteropathy <p>uncommon causes :</p> <p>CMH</p> <p>C—constrictive pericarditis</p> <p>M—Meigs syndrome --ovarian tumor + rt sided effusion</p> <p>H—Hypothyroidism / Myxoedema</p>

Bilateral pleural effusion?	Pleural effusion with lymphadenopathy
<p>TO remember</p> <p>LIST</p> <p>L—Lymphoma</p> <p>I—infarction (pulmonary infarction)</p> <p>S—SLE</p> <p>T— all Transudative causes (first mention this cause to examiner) (to remember 4 system heart , liver, kidney , GIT)</p> <ol style="list-style-type: none"> 1. Heart--CCF 2. Liver--cirrhosis of liver 3. Kidney --nephrotic syndrome 4. GIT--malabsorption / malnutrition / protein losing enteropathy 	<p>CLAST</p> <p>C—carcinoma (bronchial carcinoma)</p> <p>L—lymphoma</p> <p>A—acute leukaemia</p> <p>S—SLE</p> <p>T—TB</p>



haemorrhagic pleural effusion ?

haemorrhagic pleural effusion

to remember **CML—TIPS**

C—carcinoma (bronchial carcinoma)

M—mesothelioma (pleural mesothelioma)

L—lymphoma

(lymphoma is common in young)

T--trauma

I—Infarction (pulmonary infarction)

P-pancreatitis

S---SLE

Causes of empyema ?

BREAST

B—bronchiectasis

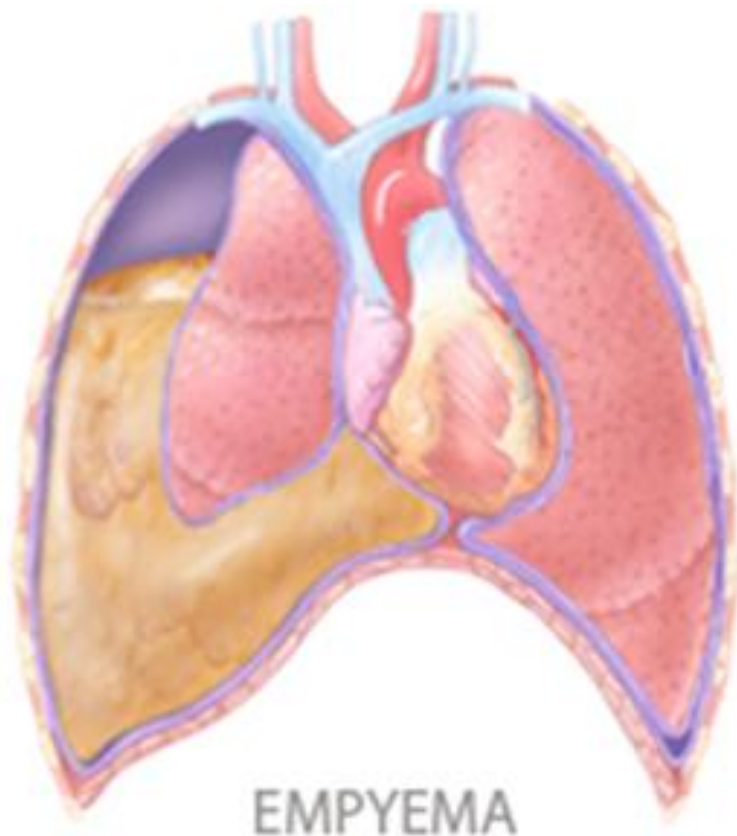
R—Rupture of liver/ subphrenic abscess

E—effusion –complication of parapneumonic effusion (/ pneumonia)

A—Abscess –lung abscess

S—secondary infection –mainly due aspiration

T—-TB





DR SHAMOL

Symptoms

Depending on underlying causes

- Asymptomatic ----in TB
- High grade fever ,toxic , chest pain –parapneumonic
- Weight loss , anorexia , low grade fever , chronic cough –TB
- Smoker , cough ,haemoptysis , chest pain , elderly –bronchial C
- Associated edema or ascites → CLD or Nephrotic syndrome
- Chest pain , breathlessness , cough , orthopnea , palpitation –heart failure
- Joint pain , morning stiffness , rash –connective tissue diseases

Sign
General exam

Anaemia	bronchial carcinoma
Puffy face	Nephrotic syndrome
Wt loss	TB or malignancy
Temperature	High grade –pneumonia Low grade –TB
Cyanosis	Heart failure
Horners syndrome	Bronchial carcinoma (Meiosis, Ipsilateral partial ptosis, Enophthalmos, anhydrosis)
JVP raised	Heart failure
Cervical lymph node & Hoarseness of voice	Bronchial carcinoma
Clubbing	Carcinoma
Edema	NS and heart failure
Joint deformity , rash ,	Connective tissue disease



Inspection	Restricted chest movement affected side
	Trachea Shift opposite (not always)
	Apex –may also shifted
Percussion	Stony dull
Auscultation	Diminish
Vocal Fremitus	Diminish

Tubercular pleural effusion

- Long HO (2 to months)
- Fever is low grade with evening rise temperature
- Weight loss
- TB is common in our country
- Fluid is Straw in color according to patients statement

parapneumonic effusion

- High grade fever (days to week)
- Short HO
- Chest pain marked
- Patient is toxic

Pleural effusion due bronchogenic carcinoma

Old age
Ho of cigarette smoking
Clubbing
Hoarseness of voice
Cervical lymph adenopathy
Feature of superior vena-cava obstruction
Horner syndrome may present
Meiosis, Ipsilateral partial ptosis, Enophthalmos, anhydrosis
No feature of Pancoast chest ((pain in the shoulder and inner arm)
Fluid color is haemorrhagic

What are the causes of dullness at a lung base?

- ☐ Pleural effusion
- ☐ Pleural thickening
- ☐ Consolidation and collapse of the lung
- ☐ Raised hemidiaphragm

How will u confirm the pleural effusion at bed side ?

` By aspiration of fluid

How color of fluid help in Diagnosis ?

straw – TB

- Turbid / pus –pneumonia /empyema
- Hemorrhagic—ca bronchus
- Serous -- transudative

Maximum aspiration per day is ?

1.5 L & removing more than 1.5 litres in one episode is inadvisable as there is a small risk of re-expansion pulmonary oedema..

When pleural effusion clinically and radiological detected ?

Pleural effusion is clinically detect if Fluid is

- 500 ml

Radiological detected in PA view if Fluid is

- 200 ml

Radiological detected in Lateral view if Fluid is

- 100 ml

USG can detect as small amount Fluid

Q. pleural effusion what type of TB is it pulmonary or extra pulmonary TB?

Ans: It is extra pulmonary TB

Q. mention the site of extra pulmonary TB ?

Ans:

- Intestine
- Bone
- Brain and meninges
- Skin
- Lymph node &Pleura

INVESTIGATION OF PLEURAL EFFUSION

1. X-ray chest P/A view
2. Hb%, TC, DC, ESR (high ESR in TB, leukocytosis in pneumonia)
3. Mantoux test (MT)
4. Aspiration of pleural fluid for analysis

Physical appearance (straw colored, serous, hemorrhagic, chylous)

- ✓ Gram-staining, cytology (routine) and exfoliative cytology (malignant cells)
 - ✓ Biochemistry (protein and sugar),
 - ✓ ADA (high in tuberculosis)
 - ✓ Culture and sensitivity (C/S)
 - ✓ AFB and mycobacterial C/S
5. Other investigation of pleural fluid (according to suspicion of cause):
- ✓ Cholesterol, LDH and rheumatoid factor
 - in rheumatoid arthritis
 - ✓ Amylase high in
 - acute pancreatitis,
 - esophageal rupture,
 - malignancy
 - ✓ Triglycerides (in chylothorax)
6. a simultaneous blood sugar, protein and lactate dehydrogenase (LDH) may be done
- 7.. Pleural biopsy by Abram's or Cope's needle
- 8.. Sputum (if present) for
- ✓ Gram staining, C/S, AFB, mycobacterial C/S and .malignant cells (exfoliative cytology)
8. If palpable lymph node:
- ✓ FNAC or biopsy (for lymphoma, metastasis)
9. Other investigations according to suspicion of causes include:
- ✓ ANF, anti-ds DNA (SLE)
 - ✓ Liver function tests
 - ✓ Urine for protein and serum total protein (nephrotic syndrome)
11. USG to detect small pleural effusion USG guided aspiration
10. CT scan
- ✓ clarify pleural abnormalities more readily than chest X-ray and ultrasonogram,
 - ✓ also helps to distinguish between benign and malignant diseases



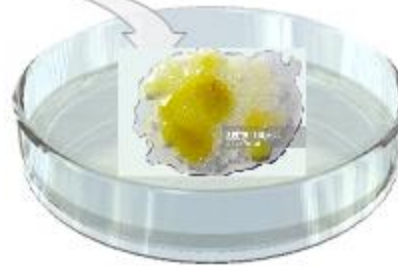
CBC & ESR



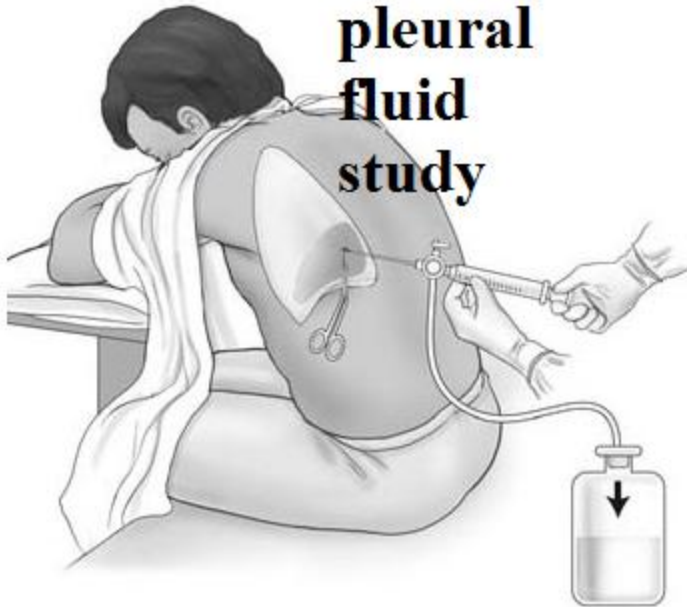
AFB, gm-stain

Sputum sample is obtained by coughing and is examined in the laboratory

malignant cell

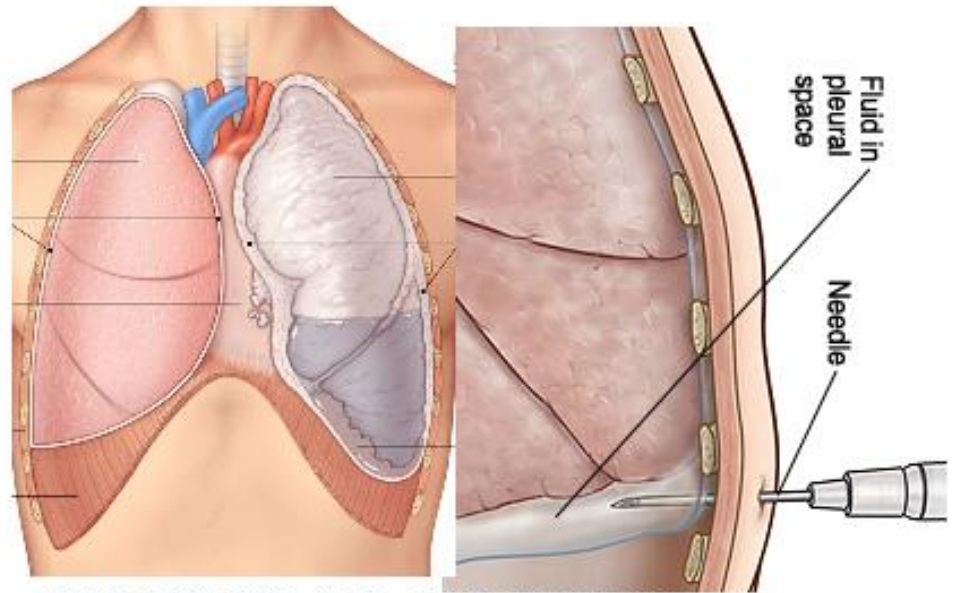
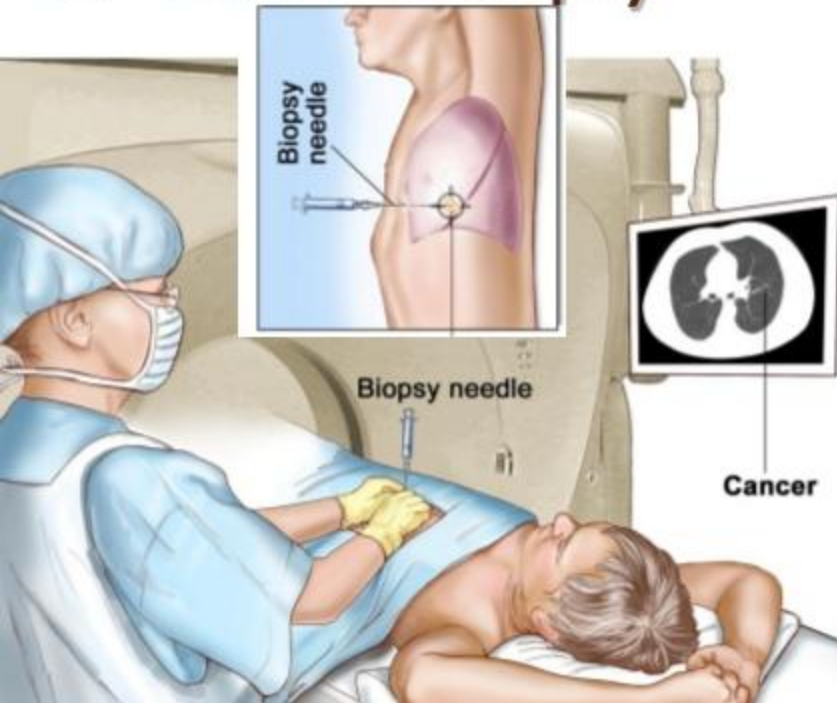


pleural fluid study



CXR-PA

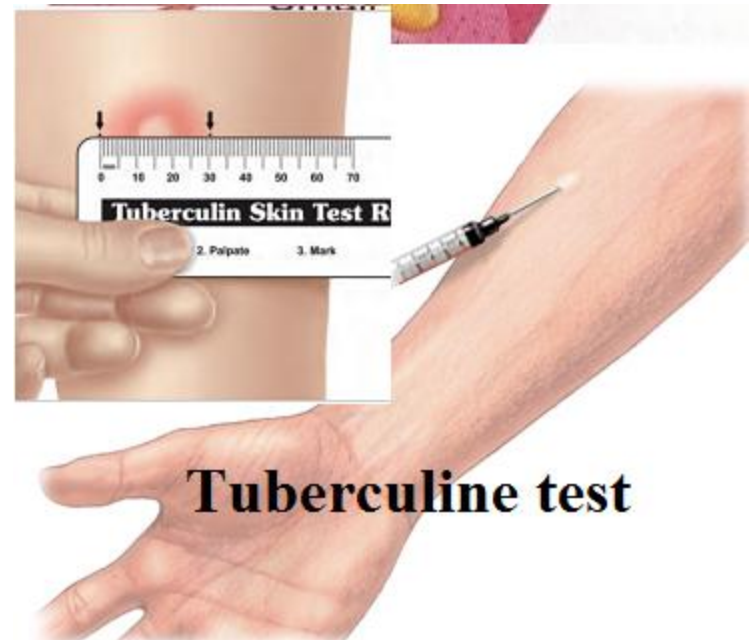
CT Guided Biopsy -



PLEURAL BIOPSY



USG of chest



Tuberculine test

What are the finding of pleural fluid study

Pleural fluid study

Color

- straw – TB
- Turbid / pus –pneumonia /empyema
- Hemorrhagic—ca bronchus
- Serous -- transudative

Biochemical

See protein and glucose

- If protein more than > 3 gm Exudative

Cytology

See inflammatory cell

Neutrophil (In pneumonia)and lymphocyte (TB)

Malignant cell

- Only given
 - when suspected malignancy
 - Or hemorrhagic effusion .
- Otherwise not routinely given

Micro biological

GM stain and AFB stain

Practically valueless

TB

Exudative with lymphocyte predominant

Parapneumonic

Exudative with Neutrophil predominant

Malignant

Exudative with malignant cell present with hemorrhagic fluid

Indication of paracentesis in pleural effusion ?

1. diagnostic purpose (only 50 ml)
2. therapeutic :
 - a. respiratory distress
 - b. massive collection
 - c. rapid collection
 - d. if suspected secondary infection

Complication of pleural effusion?

1. thicken pleura
2. empyema thoracis
3. hydro-pneumothorax
4. if long standing –collapsed lung may turn into fibrosis

Treatment of refractory pleural effusion? Malignant pleural effusion treatment?

Treatment of refractory pleural effusion is **Pleurodesis**

this can be achieved by

Chemical pleurodosis→by give Inj. Tetracycline, Kaolin or Talc via IT tube

Surgical pleurodosis→ pleural abrasion or parietal pleurectomy

In case of malignancy pleurodosis is done by injecting --bleomycin

Complication of plural fluid aspiration?

hydropneumothorax

secondary infection → empyema

subcutaneous emphysema

pleural shock

What other investigation you want to do?

I want to do pleural biopsy

How much sensitive is pleural biopsy?

In tuberculosis, AFB is positive in pleural fluid in 20% cases

In case of TB pleural biopsy is positive 80% case

In case of Malignancy biopsy is positive in 40 % case

Which type of needle use to do pleural biopsy?

Abraham needle or coopers needle

Recently what is seen in pleural fluid to Dx TB?

Pleural fluid for ADA --ADA-Adenine Deaminase

How will u differentiate between hemorrhagic effusion from Traumatic haemorrhage ?

In Hemorrhagic effusion

Does not clot and uniform distribution

In Traumatic haemorrhage

Clot on the tube or on standing

Why steroid use in pleural effusion ?

- To prevent adhesion
- To early healing and absorption

special feature pleural effusion in RA ?

- ✓ More in male sex
- ✓ rheumatoid factor in serum, pleural fluid
- ✓ the presence of nodules
- ✓ Other systemic manifestations.

Why effusions occur IN RA?

- ✓ The effusion is thought to develop as an inflammatory response to the presence of multiple subpleural nodules.

Which side?

- ✓ the left side is the more common site of unilateral rheumatoid pleural effusions.

The patient used to be a shipbuilder: what diagnosis would you consider?

- ✓ patient has malignant mesothelioma because he was exposed to asbestos (amphibole asbestos confers a higher risk of mesothelioma (dose for dose) than the more commonly used chrysotile or white asbestos, although the latter is as potent at causing carcinoma lung).

For pneumothorax see the following link

http://www.mediafire.com/file/b5c368968ax6cit/X-ray_pneumothorax_by_dr_shamol.pdf

For bronchial carcinoma see following link

http://www.mediafire.com/file/gkm1ktvq1k91v0p/CXR-Bronchial_ca_by_dr_shamol.pdf